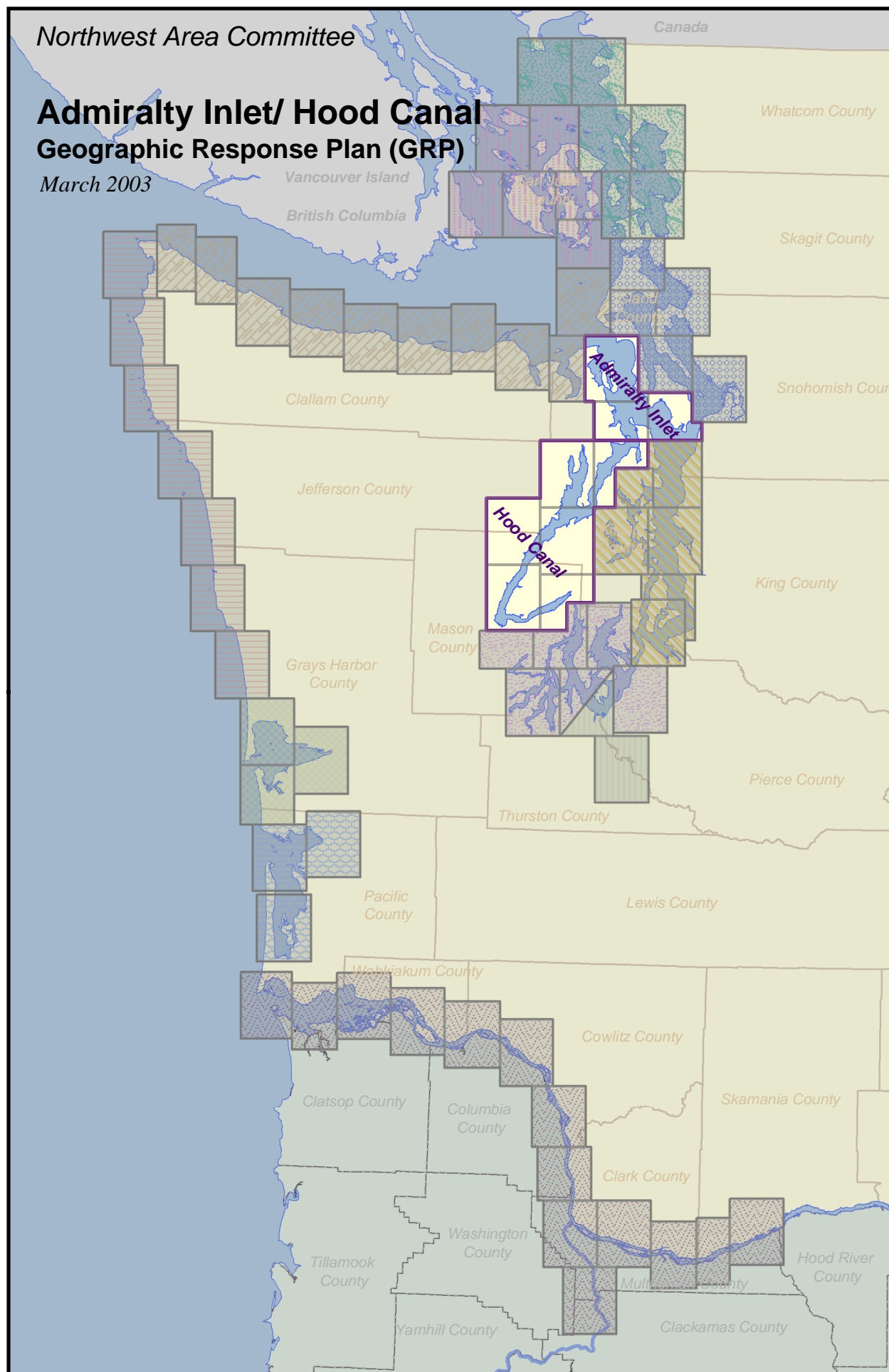


*Northwest Area Committee*

# **Admiralty Inlet/ Hood Canal Geographic Response Plan (GRP)**

*March 2003*



## SPILL RESPONSE CONTACT SHEET

### Required Notifications For Hazardous Substance or Oil Spills

USCG National Response Center.....	<b>(800) 424-8802</b>
In Oregon:	
Department of Emergency Management .....	<b>(800) 452-0311</b>
In Washington:	
Emergency Management Division.....	<b>(800) 258-5990</b>
Department of Ecology Northwest Regional Office.....	<b>(425) 649-7000</b>
Department of Ecology Southwest Regional Office.....	<b>(360) 407-6300</b>

#### U.S. Coast Guard

National Response Center	<b>(800) 424-8802</b>
Marine Safety Office Puget Sound:	
Watchstander	<b>(206) 217-6232</b>
Safety Office	<b>(206) 217-6232</b>
Marine Safety Office Portland:	
Watchstander	<b>(503) 240-9301</b>
Safety Office	<b>(503) 240-9379</b>
Pacific Strike Team	<b>(415) 883-3311</b>
District 13:	
MEP/drat	<b>(206) 220-7210</b>
Command Center	<b>(206) 220-7001</b>
Public Affairs	<b>(206) 220-7237</b>
Vessel Traffic Service (VTS)	<b>(206) 217-6050</b>

#### Environmental Protection Agency (EPA)

Region 10 Spill Response	<b>(206) 553-1263</b>
Washington Ops Office	<b>(360) 753-9083</b>
Oregon Ops Office	<b>(503) 326-3250</b>
Idaho Ops Office	<b>(208) 334-1450</b>
RCRA/ CERCLA Hotline	<b>(800) 424-9346</b>
Public Affairs	<b>(206) 553-1203</b>

#### National Oceanic Atmosphere Administration

Scientific Support Coordination	<b>(206) 526-6829</b>
Weather	<b>(206) 526-6087</b>

#### Canadian

Marine Emergency Ops/Vessel Traffic	<b>(604) 666-6011</b>
Environmental Protection	<b>(604) 666-6100</b>
B.C. Environment	<b>(604) 356-7721</b>

#### Department of Interior

Environmental Affairs	<b>(503) 231-6157</b>
	<b>(503) 621-3682</b>

#### U.S. Navy

Naval Shipyard	<b>(360) 476-3466</b>
Naval Base Seattle	<b>(360) 315-5440</b>
Supervisor of Salvage	<b>(202) 695-0231</b>

#### Army Corps of Engineers

Hazards to Navigation	<b>(206) 764-3400</b>
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#### Port Gamble S'Klallam Tribe

Tribal Office	<b>(360) 297-2646</b>
After Hours Emergencies	<b>(360) 297-6333</b>

#### Skokomish Tribe

Tribal Office	<b>(360) 426-4232</b>
After Hours Emergencies	<b>(360) 426-4232</b>

#### Federal O.S.R.O./

##### State Approved Response Contractors

All Out Indust. & Env. Services	<b>(360) 414-8655</b>
Certified Cleaning Services, Inc.	<b>(253) 536-5500</b>
Clean Sound Cooperative, Inc.	<b>(425) 783-0908</b>
Cowlitz Clean Sweep, Inc.	<b>(360) 423-6316</b>
FOSS Environmental	<b>(800) 337-7455</b>
Global Diving and Salvage	<b>(206) 623-0621</b>
Guardian Industrial Services, Inc.	<b>(253) 536-0455</b>
Island Oil Spill Association	<b>(360) 378-5322</b>
Matrix Service, Inc.	<b>(360) 676-4905</b>
MSRC	<b>(425) 252-1300</b>
National Response Corporation	<b>(206) 340-2772</b>

#### Washington State

Department of Ecology Headquarters	<b>(360) 407-6900</b>
Southwest Region	<b>(360) 407-6300</b>
Northwest Region	<b>(425) 649-7000</b>
Central Region	<b>(509) 575-2490</b>
Eastern Region	<b>(509) 456-2926</b>

Department of Fish and Wildlife	<b>(360) 534-8233</b>
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Emergency Management Division	<b>(360) 438-8639</b>
	<b>(800) 258-5990</b>

#### State Patrol

Bellevue	<b>(425) 455-7700</b>
Tacoma	<b>(253) 536-6210</b>
Bremerton	<b>(360) 478-4646</b>

#### Oregon State

Department of Environmental Quality	<b>(503) 229-5733</b>
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Emergency Management	<b>(503) 378-6377</b>
	<b>(800) 452-0311</b>

## HOW TO USE THIS GEOGRAPHIC RESPONSE PLAN

### Purpose of Geographic Response Plan (GRP)

**This plan prioritizes resources to be protected and allows for immediate and proper action. By using this plan, the first responders to a spill can avoid the initial confusion that generally accompanies any spill.**

Geographic Response Plans are used during the emergent phase of a spill which lasts from the time a spill occurs until the Unified Command is operating and/or the spill has been contained and cleaned up. Generally this lasts no more than 24 hours. The GRPs constitute the federal on-scene coordinators' and state on-scene coordinators' (Incident Commanders) "orders" during the emergent phase of the spill. During the project phase, the GRP will continue to be used, and the planned operation for the day will be found in the Incident Action Plan's Assignment List (ICS Form 204). The Assignment List is prepared in the Planning Section with input from natural resource trustees, the Incident Objectives (ICS Form 202), Operations Planning Worksheet (ICS Form 215), and Operations Section Chief.

### Strategy Selection

Chapter 4 contains complete strategy descriptions in matrix form, response priorities, and strategy maps. The strategies depicted in Chapter 4 should be implemented as soon as possible, following the priority table in Section 2 with the "Potential Spill Origin" closest to the actual spill origin. These strategy deployment priorities may be modified by the Incident Commander(s) after reviewing on scene information, including: tides, currents, weather conditions, oil type, initial trajectories, etc.

**It is assumed that control and containment at the source is the number one priority of any response.** If, in the responder's best judgment, this type of response is infeasible then the priorities laid out in Chapter 4, Section 2 take precedence over containment and control.

It is important to note that strategies rely on the spill trajectory. A booming strategy listed as a high priority would not necessarily be implemented if the spill trajectory and booming location did not warrant action in that area. However, the priority tables should be followed until spill trajectory information becomes available, and modifications to the priority tables must be approved by the Incident Commander(s).

The strategies discussed in this GRP have been designed for use with persistent oils and may not be suitable for other petroleum or hazardous substance products. For hazardous substance spills, refer to the Northwest Area Contingency Plan, Chapter 7000.

### Standardized Response Language

In order to avoid confusion in response terminology, this GRP uses standard National Interagency Incident Management System, Incident Command System (NIIMS, ICS) terminology and strategy names, which are defined in Appendix A, Table A-1 (e.g. diversion, containment, exclusion).

## Record of Changes

[illegible]

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## Admiralty Inlet / Hood Canal, Washington

### GEOGRAPHIC RESPONSE PLAN

#### 1. INTRODUCTION: SCOPE OF THIS PROJECT

Geographic Response Plans are intended to help the first responders to a spill avoid the initial confusion that generally accompanies any spill. This document serves as the federal and state on-scene-coordinators “orders” during a spill in the area covered by this GRP (see Chapter 3 for area covered). As such, it has been approved by the U.S. Coast Guard Marine Safety Office and the Washington State Department of Ecology Spills Program. Changes to this document are expected as more testing is conducted through drills, site visits, and actual use in spill situations. To submit comments, corrections, or suggestions please refer to Appendix C.

GRPs have been developed for the marine and inland waters of Washington, Oregon, and Idaho. They are prepared through the efforts and cooperation of the Washington Department of Ecology, Washington Department of Fish and Wildlife, Oregon Department of Environmental Quality, Idaho State Emergency Response Commission, the U.S. Coast Guard, the Environmental Protection Agency, tribes, other state and federal agencies, response organizations, and local emergency responders.

GRPs were developed through workshops involving federal, state, and local oil spill emergency response experts, response contractors, and representatives from tribes, industry, ports, environmental organizations, and pilots. Workshop participants identified resources which require protection, developed operational strategies, and pinpointed logistical support. A similar process has been used for major updates.

Following the workshops, the data gathered was processed and reproduced in the form of maps and matrices which appear in Chapters 4 through 6. The maps in Chapters 5 and 6 were generated using Canvas. Maps for Chapter 4 were generated using ArcView GIS. The matrices were created using MS Excel, and the balance of each GRP was produced using MS Word.

The first goal of a GRP was to identify, with the assistance of the Washington State Natural Resource Damage Assessment Team, resources needing protection; response resources (boom, boat ramps, vessels, etc.) needed, site access and staging, tribal and local response community contacts, and local conditions (e.g. physical features, hydrology, currents and tides, winds and climate) that may affect response strategies. Note that GRPs only address protection of sensitive **public** resources. It is the responsibility of private resource owners and/or potentially liable parties to address protection of private resources (such as commercial marinas, private water intakes, and non-release aquaculture facilities).

Secondly, response strategies were developed based on the sensitive resources noted, hydrology, and climatic considerations. Individual response strategies identify the amount of boom necessary for implementation. The response strategies are then applied to Potential Spill Origins and trajectory modeling, and prioritized, taking into account factors such as resource sensitivity, feasibility, wind, and tidal conditions.

Draft strategy maps and matrices were sent out for review and consideration of strategy viability. Field verification was conducted for some strategies, and changes proposed by the participants were included in a semi-final draft, which was offered for final review to all interested parties and the participants of the field verification.

Finally, the general text of the GRP was compiled along with the site description, reference maps, and logistical support.

Items included in Logistical Support:

- Location of operations center for the central response organization;
- Local equipment and trained personnel;
- Local facilities and services and appropriate contacts for each;
- Site access & contacts;
- Staging areas;
- Helicopter and air support;
- Local experts;
- Volunteer organizations;
- Potential wildlife rehabilitation centers;
- Marinas, docks, piers, and boat ramps;
- Potential interim storage locations, permitting process;
- Damaged vessel safehavens;
- Vessel repairs & cleaning;
- Response times for bringing equipment in from other areas.

## 2. SITE DESCRIPTION

Admiralty Inlet and Hood Canal are located in the northwest corner of Washington State. Admiralty Inlet extends from eastern Strait of Juan de Fuca to Foulweather Bluff, and Hood Canal separates the Olympic Peninsula from the Kitsap Peninsula. Local economies are based primarily on natural resource use and tourism.

This plan is divided into two regions, Admiralty Inlet and Hood Canal. Admiralty Inlet is comprised of the area north of the Hood Canal Bridge to Port Townsend. It is also a biologically rich area with several types of fisheries resources, clams and marine birds. Dall porpoise and harbor seals also frequent the area. Salmon pass through the Inlet enroute to Hood Canal and Puget Sound in early fall.<sup>1</sup>

Hood Canal is bounded by Hood Canal Bridge to the north and continues southward to Belfair. The canal supports significant populations of groundfish, clams, shrimp, Dungeness Crab, as well as several other fish resources. It is also a major marine habitat for river otters and species of marine birds.

Refer to Chapter 6 for detailed resource information.

### 2.1. Physical Features

The shorelines of Hood Canal are generally characterized by sand and cobble beaches, sand and gravel beaches, tidal flats, and marshes. Admiralty Inlet, not as sheltered as Hood Canal, also has many sand and cobble beaches, and sand and gravel beaches.

Hood Canal and Admiralty Inlet includes the following shoreline habitats:<sup>2</sup>

- Sheltered rocky shores
- Pocket beaches
- Wave cut platforms
- Sand and cobble beaches
- Sand and gravel beaches
- Exposed tidal flats
- Sheltered tidal flats
- Marshes

Traffic in Admiralty Inlet is primarily commercial and ferry vessels using the traffic separation zone from the Strait of Juan de Fuca to Puget Sound. Naval bases are located at Bangor and Indian Island. Hood Canal has many state parks along its shores and small rivers leading to the Canal.

### 2.2. Hydrology

Admiralty Inlet and Hood Canal are generally a two-layer system. There is a net southerly flow from surface to bottom along the west side of Whidbey Island to the head of Admiralty Inlet. Net surface currents generally flow seaward and exit through Admiralty Inlet.

Hood Canal surface water is less saline than Admiralty Inlet due to runoff from rivers, however, there is vertical mixing in both areas. Surface water, with freshwater input from land, has net seaward movement, while deeper waters flow landward. Because of mixing, some of the seaward-flowing surface water is entrained with the landward net flow, and it returns toward land. Therefore, instead of flowing

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<sup>1</sup> Evans-Hamilton, Inc. and D.R. Systems, Inc, Puget Sound Environmental Atlas, vol. 1 (1987).

<sup>2</sup> National Oceanic and Atmospheric Administration, Environmental Sensitivity Index, Central & Southern Puget Sound (Seattle: 1984).

towards sea, pollutants could remain in both Hood Canal and Admiralty Inlet, and may even flow in toward Puget Sound.<sup>3</sup>

### 2.3. Currents and Tides

The mean tidal range (MHW-MLW) for Admiralty Inlet is 5.2 to 6.0 feet, and the diurnal tidal (MHHW-MLLW) range is 8.4 to 9.4 feet. Hood Canal mean tidal ranges are slightly greater, 6.4 to 8.04 feet, and diurnal tidal range is 9.9 to 12.11 feet.<sup>4</sup>

The currents between Point Wilson and Bush Point are strong, between 1.6 and 3.4 knots on the flood and 2.6 and 3.5 knots on the ebb. The currents begin to weaken at Foulweather Bluff where the average flood is 0.7 knots and the average ebb is 0.9 knots. The currents gradually weaken further into Hood Canal, becoming weak and variable south of Dabob Bay. The currents increase in strength at the Great Bend off Sisters Point.<sup>5</sup>

Tides and currents may vary with seasonal runoff and lunar cycles in localized areas. Spill responders should consult tide and current tables for their particular location.

### 2.4. Winds

The winds in this area are a direct result of diverse topography including the Cascade and Olympic Mountains. The westerly winds from the Pacific appear to flow to the north and south around the Olympics, causing what is commonly known as the “Puget Sound Convergence” on the eastern side.

From October through March, winds are generally southeast to southwest at 0 to 9 mph in Admiralty Inlet. At 10 to 20 mph, Hood Canal has a history of stronger winds during the winter. During spring and summer, the winds are usually from the northwest at 0 to 9 mph.<sup>6</sup>

### 2.5. Climate

The area has a maritime climate with cool summers and mild winters. Annual precipitation is between 18 and 50 inches. Fog is also very common throughout the entire Hood Canal and Admiralty Inlet area during autumn and winter months.

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<sup>3</sup> Evans Hamilton, Inc. and D.R. Systems, Inc, Puget Sound Environmental Atlas, vol. 1. (1987) 122..

<sup>4</sup> National Oceanic and Atmospheric Administration, Tide Tables West Coast of North and South America (1994).

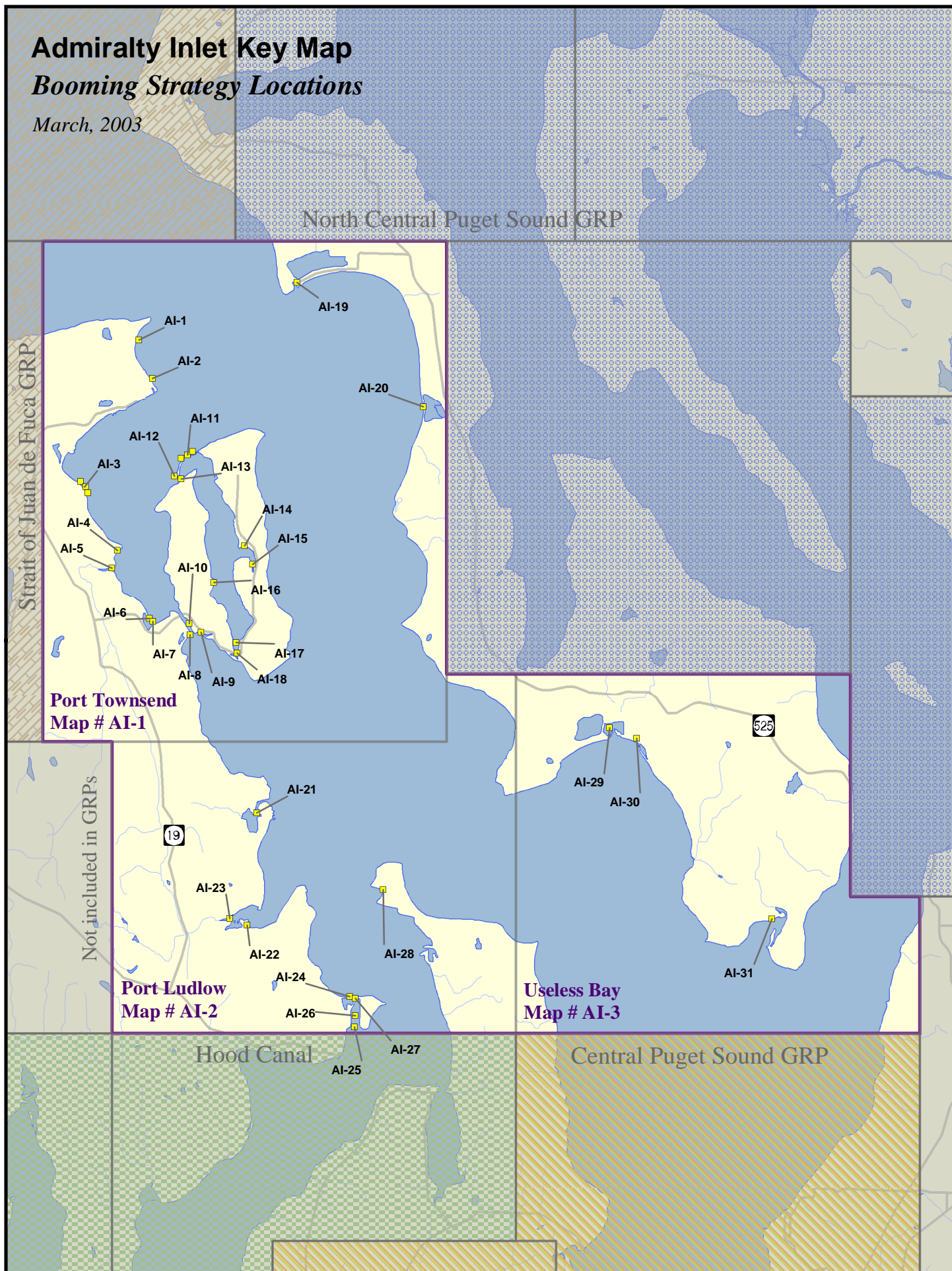
<sup>5</sup> National Oceanic and Atmospheric Administration, Tidal Current Tables Pacific Coast of North and South America (1994).

<sup>6</sup> State of Washington Department of Natural Resources, Washington Marine Atlas, South Inland Waters, vol. 2 (1972).

# Admiralty Inlet Key Map

## Booming Strategy Locations

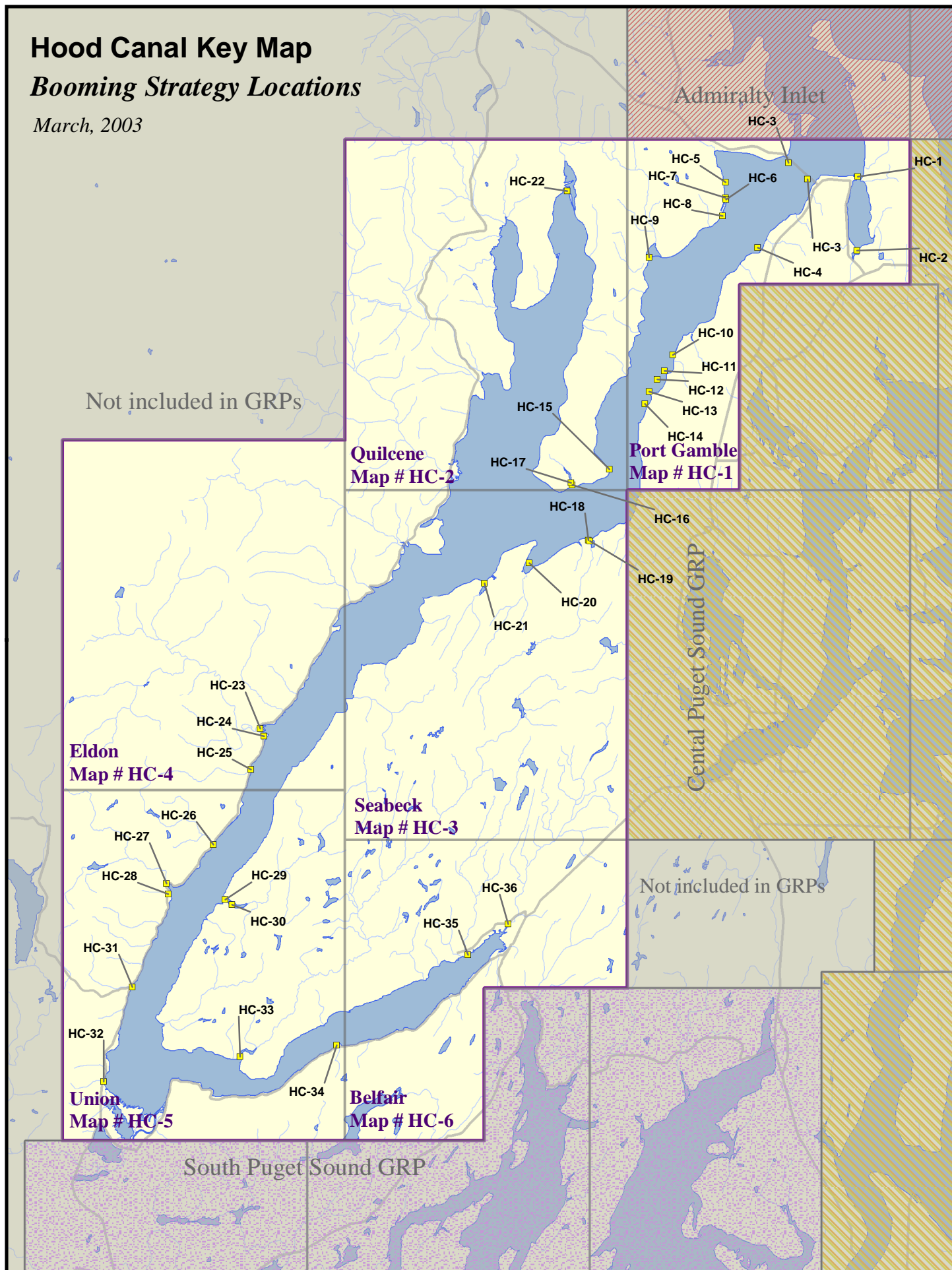
March, 2003



# Hood Canal Key Map

## Booming Strategy Locations

March, 2003



## 4. GENERAL PROTECTION/COLLECTION STRATEGIES

### 4.1. Chapter Overview

This chapter details the specific response strategies and resources to protect as outlined by the participants of the GRP workshop for the Admiralty Inlet / Hood Canal area. It describes the strategies determined for each area and the prioritization of those strategies. Note that GRPs only address protection of sensitive **public** resources. It is the responsibility of private resource owners and/or potentially liable parties to address protection of private resources (such as commercial marinas, private water intakes, and non-release aquaculture facilities).

### Maps & Matrices

The maps in this chapter provide information on the specific location of booming strategies. They are designed to help the responder visualize response strategies. Details of each booming strategy are listed in corresponding matrix tables. Each matrix indicates the exact location, intent and implementation of the strategy indicated on the map. The "Status" column describes whether the strategy has been visited or tested in the field, and the date of the visit/test. Most strategies include a number for the corresponding shoreline photo, which is available on the Washington Department of Ecology's internet site at <http://www.ecy.wa.gov/apps/shorephotos/>.

### Major Protection Techniques

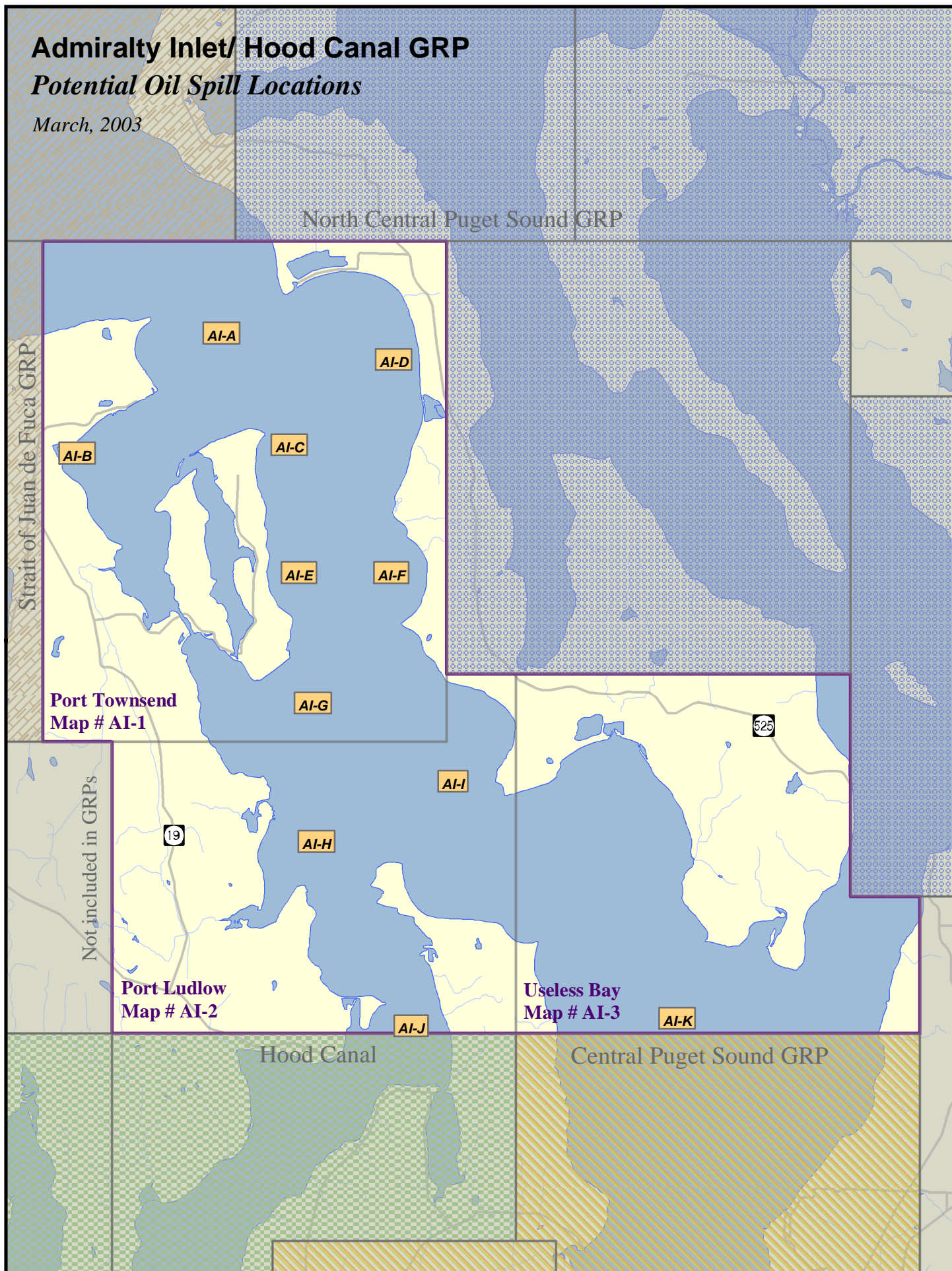
All response strategies fall into one of three major techniques that may be utilized either individually or in combination. The strategies listed in Section 4.2 are based on the following techniques, and are explained in detail in Section 4.3:

**Dispersants:** Washington State Policy currently does not allow use of dispersants in this area. Certain chemicals break up slicks on the water. Dispersants can decrease the severity of a spill by speeding the dissipation of certain oil types. Their use will require approval of the Unified Command. Dispersants will only be used in offshore situations under certain conditions, until further determinations are made by the Area Committee and published in the Area Contingency Plan.

**In Situ Burning:** Approval to burn in this area is unlikely due to the proximity of population to a potential burn site. Burning requires the authorization of the Unified Command, who determine conformance of a request to burn with the guidelines set forth in the Area Plan. This option is preferable to allowing a slick to reach the shore provided that population areas are not exposed to excessive smoke. Under the right atmospheric conditions, a burn can be safely conducted in relative close proximity to human population. This method works on many types of oil, and requires special equipment including a fire boom and igniters.

**Mechanical Recovery and Protection Strategies:** If a spill is too close to shore to use In Situ burning or dispersants, the key strategies are skimming and use of collection, diversion, or exclusion booming to contain and recover the oil, and prevent it from entering areas with sensitive wildlife and fisheries resources. These options are described in detail in Appendix A. Specific skimming strategies are not listed in the maps and matrices, but skimming should be used whenever possible and is often the primary means of recovering oil and protecting resources, especially when booming is not possible or feasible.

**Priorities:** The strategy priority tables (Section 4.2.) were developed using specific locations where spills are likely to occur. Trajectory modeling was used for each of these "Potential Spill Origins" to identify sensitive resources that would likely be impacted within the initial hours of the spill. A booming strategy priority table was developed for each of the "Potential Spill Origins" based on the sensitivity of resources, feasibility, etc. **Booming strategies should be deployed following the priority table for the "Potential Spill Origin" closest to the actual spill origin.** The map on page 4-2 shows the locations of all Potential Spill Origins for the Admiralty Inlet / Hood Canal GRP (no tables were developed for Hood Canal). The booming strategies indicated in the priority tables are explained in detail in the Maps & Matrices section (Section 4.3.). It is implied that control and containment at the source is the number one priority of any response. If in the responder's best judgment this is not feasible, then the priorities laid out in the priority tables take precedence over containment and control.



## 4.2.2 BOOMING STRATEGY PRIORITY TABLES

Table 4-1

<b>Potential Spill Origin: AI-A - Point Wilson</b>			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	AI-1	4-8	
2	AI-2	4-8	
3	AI-11	4-8	
4	AI-12	4-8	
5	AI-13	4-8	
6	AI-16	4-8	If strategies AI-11, 12, and 13 can be successfully deployed, skip to booming priority # 11. Deploy strategies AI-14 thru AI-18 only if strategies AI-11, 12, and 13 cannot be deployed.
7	AI-14	4-8	
8	AI-15	4-8	
9	AI-18	4-8	
10	AI-17	4-8	
11	AI-19	4-8	
12	AI-20	4-8	
13	STR-41	4-16	Refer to Strait of Juan de Fuca GRP for STR strategies

Table 4-2

<b>Potential Spill Origin: AI-B - Port Townsend Paper</b>			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	AI-3	4-8	
2	AI-4	4-8	
3	AI-5	4-8	
4	AI-11	4-8	
5	AI-12	4-8	
6	AI-13	4-8	
7	AI-2	4-8	
8	AI-1	4-8	

Table 4-3

<b>Potential Spill Origin: AI-C - Northeast corner of Marrowstone Island</b>			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	AI-1	4-8	
2	AI-2	4-8	
3	AI-19	4-8	

Table 4-4

<b>Potential Spill Origin: AI-D - Admiralty Bay</b>			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	AI-19	4-8	
2	AI-20	4-8	

Table 4-5

<b>Potential Spill Origin: AI-E - Marrowstone Island</b>			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	AI-1	4-8	
2	AI-2	4-8	
3	AI-11	4-8	
4	AI-12	4-8	
5	AI-13	4-8	
6	AI-18	4-8	
7	AI-9	4-8	
8	AI-10	4-8	
9	AI-8	4-8	
10	AI-19	4-8	
11	AI-21	4-9	
12	AI-28	4-9	

Table 4-6

<b>Potential Spill Origin: AI-F - Bush Point</b>			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	AI-19	4-8	
2	AI-20	4-8	

Table 4-7

<b>Potential Spill Origin: AI-G - Oak Bay</b>			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	AI-28	4-9	
2	AI-1	4-8	
3	AI-2	4-8	
4	AI-18	4-8	
5	AI-24	4-9	
6	AI-21	4-9	
7	AI-9	4-8	
8	AI-10	4-8	
9	AI-8	4-8	
10	AI-19	4-8	
11	AI-11	4-8	
12	AI-20	4-8	

Table 4-8

<b>Potential Spill Origin: AI-H - Mats Mats Bay</b>			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	AI-24	4-9	
2	AI-27	4-9	
3	AI-25	4-9	
4	AI-26	4-9	
5	AI-21	4-9	
6	AI-28	4-9	
7	AI-18	4-8	
8	AI-9	4-8	
9	AI-10	4-8	
10	AI-8	4-8	
11	AI-1	4-8	
12	AI-2	4-8	
13	AI-23	4-9	
14	AI-22	4-9	

Table 4-9

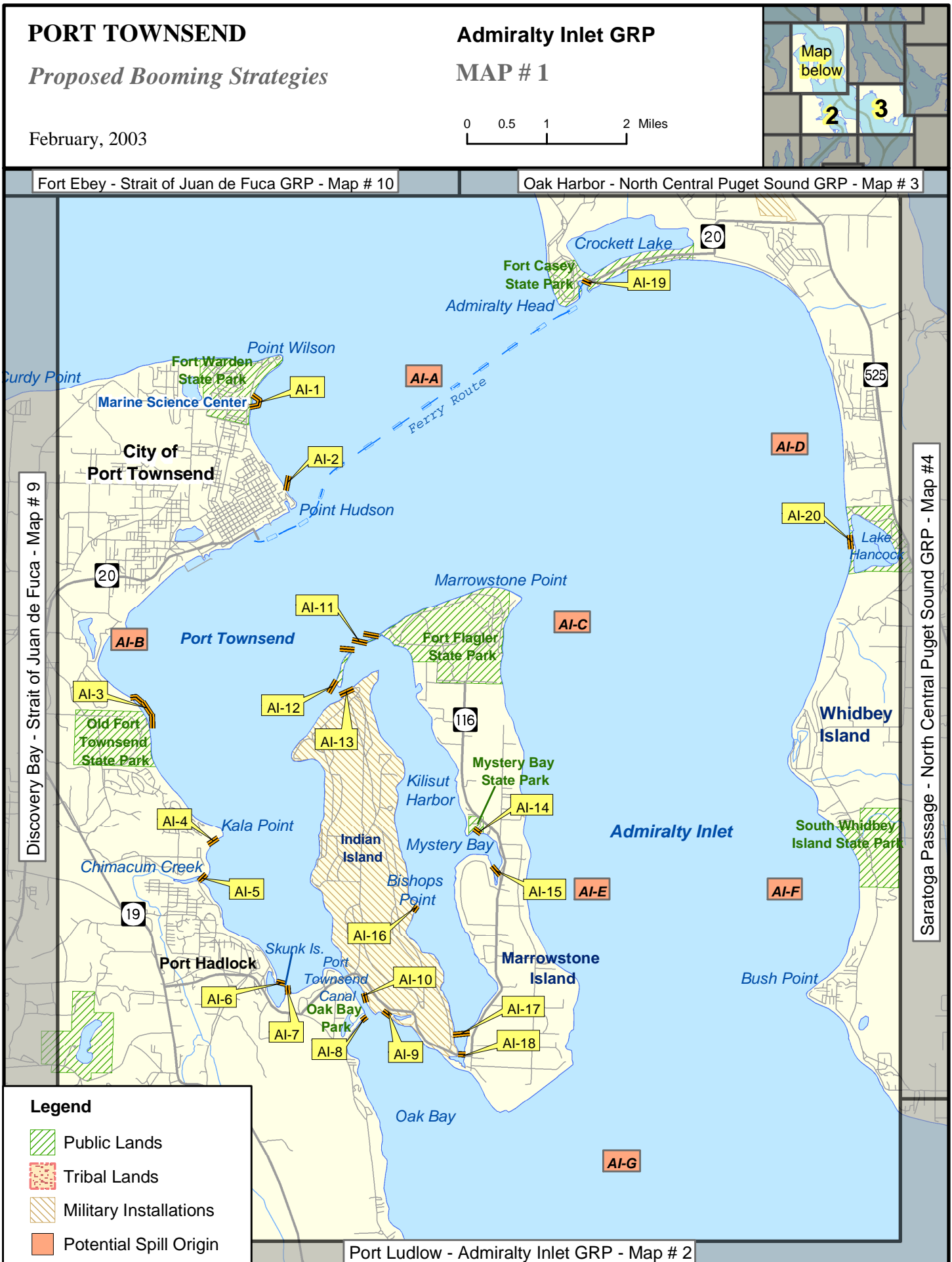
<b>Potential Spill Origin: AI-I - Double Bluff</b>			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	AI-19	4-8	
2	AI-20	4-8	

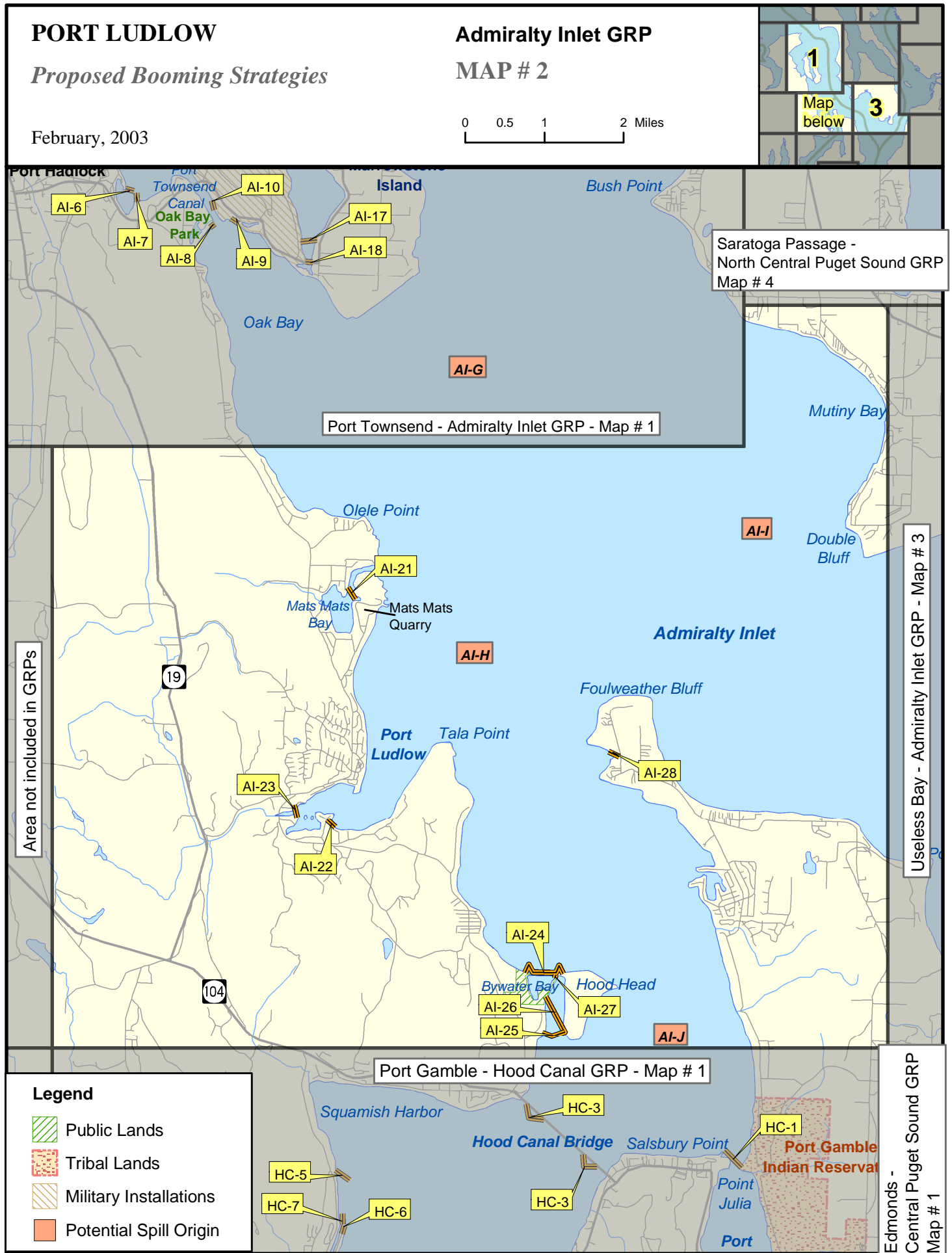
Table 4-10

<b>Potential Spill Origin: AI-J - Hood Canal, North of Port Gamble</b>			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	HC-1	4-18	Refer to the Hood Canal GRP for HC strategies
2	AI-27	4-9	
3	AI-25	4-9	
4	AI-26	4-9	
5	AI-24	4-9	
6	AI-28	4-9	
7	HC-6	4-18	Refer to the Hood Canal GRP for HC strategies
8	HC-7	4-18	
9	HC-5	4-18	
10	HC-4	4-18	
11	HC-8	4-18	

Table 4-11

<b>Potential Spill Origin: AI-K - Southwest of Cultus Bay</b>			
BOOMING PRIORITY	STRATEGY NUMBER	MAP PAGE NUMBER	COMMENTS
1	AI-31	4-10	
2	AI-29	4-10	
3	AI-30	4-10	



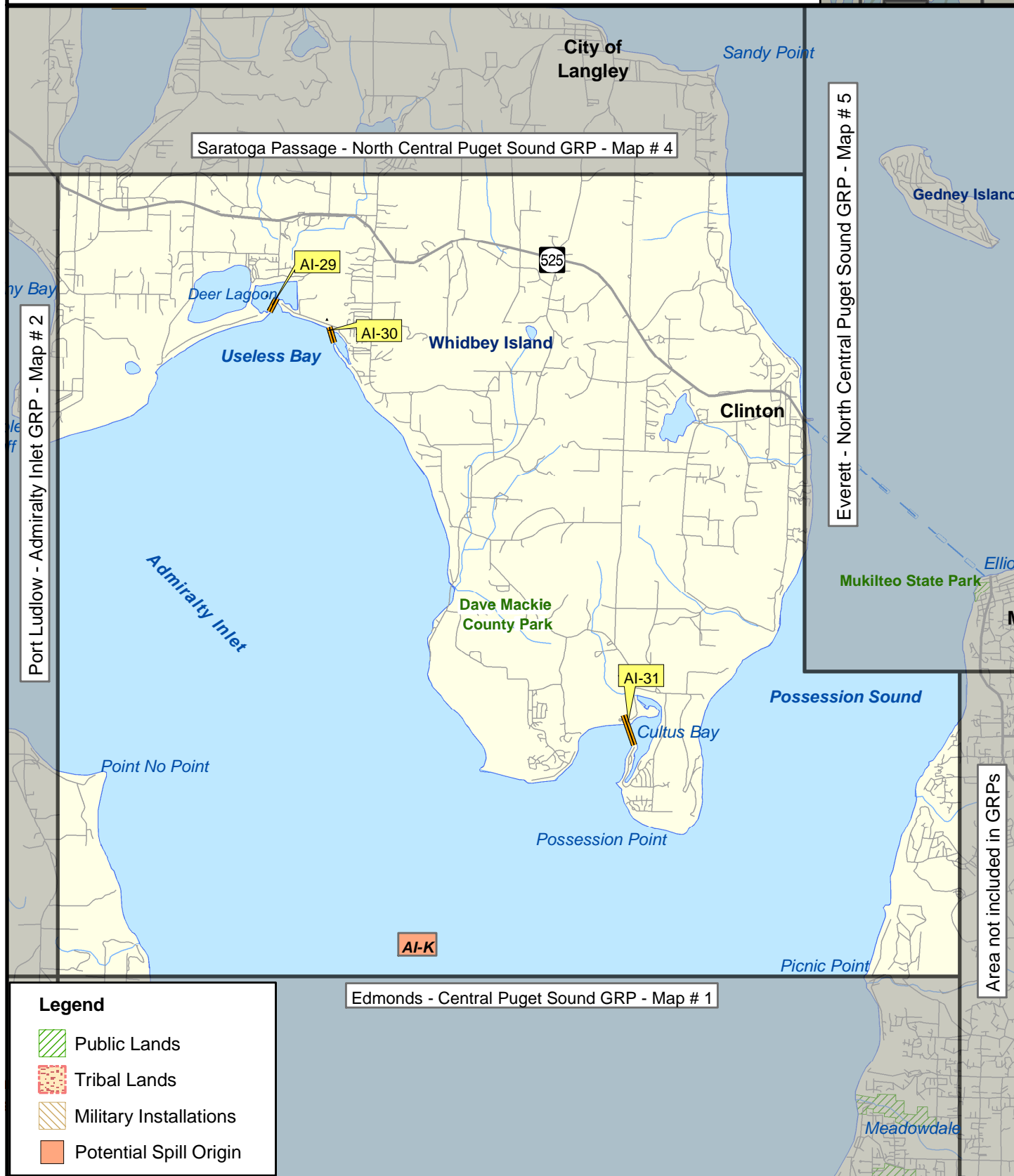
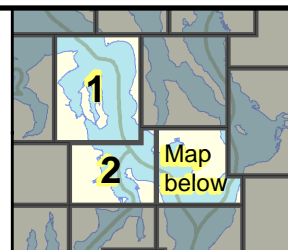


**USELESS BAY*****Proposed Booming Strategies***

February, 2003

**Admiralty Inlet GRP****MAP # 3**

0 0.5 1 2 Miles



**4.3.1.2 Proposed Booming and Collection Strategies: Matrices - ADMIRALTY INLET**

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
AI-1		Port Townsend Marine Science Center JEF0611 48°-8.131' N 122°-45.633' W	Exclusion - Protect Science Center pier.	1200'	Enclose science center pier, protect water intakes.	Science Center Pier.	Road access to Science Center, boat ramp adjacent to Science Center.	Science Center marine life.
AI-2		Beach north of Point Hudson JEF0604 48°-7.166' N 122°-45.097' W	Deflection/ collection - Keep oil from moving into Port Townsend.	1000'	Deploy boom at position where vac truck access is possible for shore-side collection.	Fort Worden State Park.	Port Townsend Marina or Fort Worden State Park.	Protect waterfowl and seabird concentrations.
AI-3		Old Port Townsend State Park JEF0588 48°-4.766' N 122°-47.172' W	Deflection - Keep oil away from park.	3200'	Set up series of overlapping deflection booms parallel to shore north of park. Old pilings along the shore may help hold the boom in place.	Stage at the park or from Port Townsend.	By boat from the Port Townsend Marina.	Sensitive nesting species; significant smelt spawning area.
AI-4		Kala Point - Marsh, south side JEF0579 48°-3.352' N 122°-46.120' W	Exclusion - Keep oil out of marsh.	200'	Place boom across entrance to marsh area south of the spit. Can be deployed from land.	Stage from Port Townsend.	By boat from Port Townsend. Vehicle access from north side of spit.	Protect sensitive marsh habitat.
AI-5		Chimacum Creek Mouth JEF0570 48°-2.943' N 122°-46.332' W	Exclusion - Keep oil out of creek.	300'	Deploy boom at an angle across the creek mouth. Can be deployed from land with a jon boat.	Stage from the Evergreen Logging Company on the south side of the creek.	Vehicle access from the Evergreen Logging Company on the south side of the creek.	Waterfowl concentration, salmonids.

### 4.3.1.2 Proposed Booming and Collection Strategies: Matrices - ADMIRALTY INLET

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
AI-6	Field tested 12/94	Port Hadlock Tidal Marsh JEF0561 48°-1.827' N 122°-44.965' W	Exclusion - Keep oil out of marsh.	600'	Deploy boom from west side of Skunk Island directly west to shoreline on sand spit.	Stage from Port Hadlock.	By boat from the Port Hadlock ramp, or from Port Townsend.	Waterfowl concentration, sensitive marsh.
AI-7	Field tested 12/94 MSRC/ Foss	Port Hadlock Tidal Marsh JEF0561 48°-1.749' N 122°-44.880' W	Exclusion - Keep oil out of marsh.	800'	Deploy boom from southeast side of Skunk Island directly south to shoreline west of marina.	Stage from Port Hadlock.	By boat from the Port Hadlock ramp, or from Port Townsend.	Waterfowl concentration, sensitive marsh.
AI-8		Oak Bay - tidal marsh on SW side of Port Townsend Canal JEF0421 48°-1.468' N 122°-43.571' W	Exclusion - Keep oil out of wetlands.	100'	Place boom along entrance to backwater area adjacent to west side of dike/jetty. Access requires the use of a jon boat.	Stage from the Oak Bay Co. Park.	Oak Bay Co. Park ramp/road, ramp may be blocked by drift logs.	Wetland habitat, seabird and waterfowl concentrations.
AI-9		Oak Bay - tidal marsh on SE side of Port Townsend Canal JEF0426 48°-1.532' N 122°-43.236' W	Exclusion - Keep oil out of marsh.	200'	Place boom at marsh outlet south of road, will need a jon boat at high tide.	Stage from the Day park off Marrowstone Island Road.	By land at day park off Marrowstone Island Road, or by water.	Salicornia salt marsh, seabird and waterfowl concentrations.
AI-10		Oak Bay - tidal marsh on SE side of Port Townsend Canal JEF0425 48°-1.699' N 122°-43.583' W	Exclusion/ Deflection - Keep oil out of marsh.	200'	Place boom at outlet to small marsh area, boom needs to be tended to deflect the oil away from the marsh opening depending on the direction of the current in the canal.	Stage from the Day park off Marrowstone Island Road.	By boat in canal; also day park 1/4 mile walk on Marrowstone Island Road.	Salicornia salt marsh, seabird and waterfowl concentrations.

**4.3.1.2 Proposed Booming and Collection Strategies: Matrices - ADMIRALTY INLET**

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
AI-11	Field tested 8/20/96	Kilisut Harbor - North entrance JEF0476 48°-2.515' N 122°-43.875' W	Deflection - Keep oil out of harbor.	3000'	Deploy three overlapping booms 1000' long each to deflect the oil past the entrance to the harbor. Current through the harbor entrance is very strong. Likely to work only with 12" fast water boom.	Fort Flagler State Park or Mystery Bay Boat Ramp.	By boat from Fort Flagler or Mystery Bay. Shoreline is U.S. Navy property, need permission for access.	Fish & wildlife resources in Kilisut Harbor. Marine mammal haulout.
AI-12	Field tested 8/20/96	Kilisut Harbor - South entrance JEF0539 48°-5.120' N 122°-44.200' W	Deflection - Keep oil out of harbor.	1000'	Deploy boom from south end of sand spit at south entrance to the harbor to deflect oil away from entrance. Current through the entrance is very strong. May only work with 12" fast water boom.	Fort Flagler State Park or Mystery Bay Boat Ramp.	By boat from Fort Flagler or Mystery Bay. Shoreline is U.S. Navy property, need permission for access.	Fish & wildlife resources in Kilisut Harbor. Marine mammal haulout.
AI-13	Field tested 8/20/96	Kilisut Harbor - South entrance JEF0539 48°-5.060' N 122°-43.950' W	Collection - Keep oil out of harbor.	1000'	Deploy boom from shore on Indian Island at angle to the west. Boom angle will need to be sharp due to strong current through entrance. Deploy boom at position where vac truck access is possible for shore-side collection.	Fort Flagler State Park or Mystery Bay Boat Ramp.	By boat from Fort Flagler or Mystery Bay. Shoreline is U.S. Navy property, need permission for access.	Fish & wildlife resources in Kilisut Harbor. Marine mammal haulout.
AI-14		Mystery Bay JEF0490 48°-3.530' N 122°-41.850' W	Exclusion - Keep oil out of marsh.	100'	Deploy boom at entrance to salt marsh on N.E. shore.	Stage from the Mystery Bay State Park.	By land from Mystery Bay State Park, or by boat from ramp at park.	Salicornia salt marsh, waterfowl concentrations, sensitive nesting species.
AI-15		Mystery Bay JEF0497 48°-3.080' N 122°-41.520' W	Exclusion/ Deflection/ Collection - Keep oil out of marsh/ mud flats.	1000'	Deploy boom from east shore of bay at an angle to the west shore for collection.	Stage from the Mystery Bay State Park.	By boat from the ramp at Mystery Bay State Park.	Salicornia salt marsh, waterfowl concentrations, sensitive nesting species.

**4.3.1.2 Proposed Booming and Collection Strategies: Matrices - ADMIRALTY INLET**

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
AI-16		Bishops Point - east shore of Indian Island JEF0524 48°-2.725' N 122°-42.760' W	Exclusion - Keep oil out of marsh on point.	100'	Deploy boom at entrance to salt marsh.	Stage from the Mystery Bay State Park.	By boat from the ramp at Mystery Bay State Park.	Salicornia salt marsh, waterfowl concentrations, sensitive nesting species.
AI-17		Kilisut Harbor - south end JEF0512 48°-1.390' N 122°-42.025' W	Exclusion - Keep oil out of marsh.	1200'	Place at northern most edge of salt marsh - low tide deployment.	Stage from the Mystery Bay State Park.	By boat from ramp at Mystery Bay State Park.	Salicornia salt marsh; waterfowl concentrations; marine mammal haulout; sensitive nesting species.
AI-18		Kilisut Harbor - South culverts JEF0431 48°-1.095' N 122°-42.000' W	Exclusion - Keep oil out of marsh.	100'	Close tide gates; place boom across outlets on north side of road if gates can't be closed. Could also use plywood and sand bags to close off the culvert.	Stage from the Mystery Bay State Park.	Road access at Highway 116.	Salicornia salt marsh; waterfowl concentrations; marine mammal haulout; sensitive nesting species.
AI-19		Crocket Lake ISL0400 48°-9.560' N 122°-40.280' W	Exclusion - Keep oil out of lake.	100'	Place boom around culvert or use plywood to prevent oil from flowing into the lake. High tide strategy only.	Stage from the Fort Casey State Park.	Road access at Highway 20.	Waterfowl and shorebird concentrations.

**4.3.1.2 Proposed Booming and Collection Strategies: Matrices - ADMIRALTY INLET**

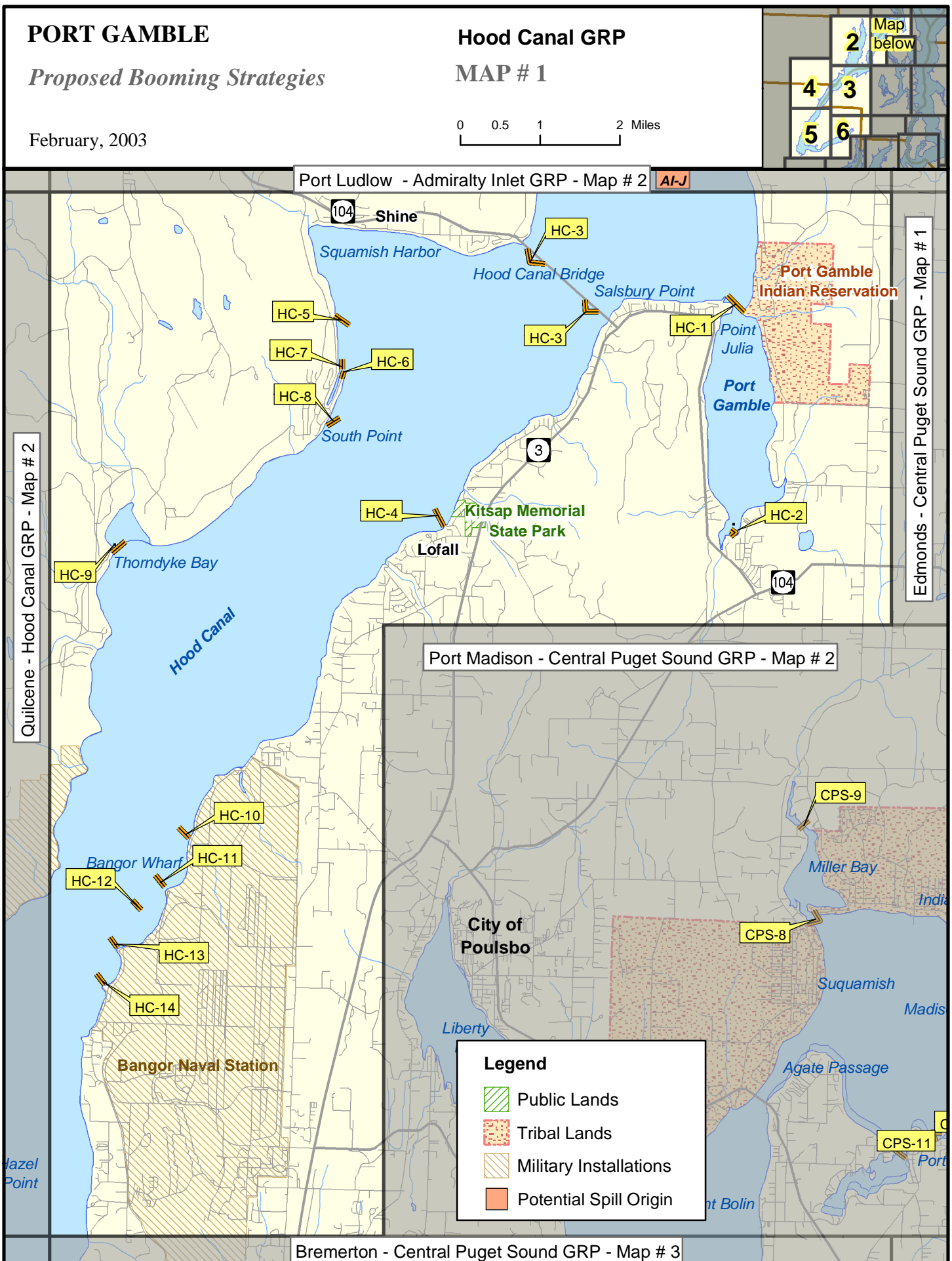
Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
AI-20		Lake Hancock - wetlands ISL0424 48°-6.800' N 122°-35.900' W	Exclusion - Keep oil out of wetlands.	200'	Deploy boom in a chevron configuration across the entrance to the lake. If current through the entrance is too high for boom, block entrance with sand bags as an alternative. Use of sand bags will require an emergency HPA permit from WDFW. Position of entrance is variable and there may be more than one entrance.	Stage from the Fort Casey State Park.	Road access from Highway 525, small road north of lake leads to beach.	Waterfowl concentrations.
AI-21		Mats Mats Bay JEF0384 47°-57.450' N 122°-41.170' W	Exclusion/ Diversion/ Collection - Keep oil out of bay.	1000'	Deploy boom from west side of channel into the bay to shore south of gravel barge slips, and divert oil into cove for barge slips and collect with vac trucks.	Stage from the boat ramp at south end of Mats Mats Bay.	Boat ramp at south end of Mats Mats Bay.	Sensitive nesting species.
AI-22		Port Ludlow tidal marsh - SE corner of bay JEF0358 47°-54.945' N 122°-41.400' W	Exclusion - Keep oil out of marsh.	100'	Deploy boom across entrance to marsh.	Stage from the Port Ludlow Marina (JEF0370).	By boat from Port Ludlow Marina.	Waterfowl and shorebird concentrations, marsh habitat.
AI-23		Port Ludlow mud flats - NW corner of bay JEF0364 47°-55.065' N 122°-41.975' W	Exclusion - Keep oil out of mud flats.	600'	Deploy boom across inlet mouth.	Stage from the Port Ludlow Marina (JEF0370).	By boat from Port Ludlow Marina.	Waterfowl and shorebird concentrations.

### 4.3.1.2 Proposed Booming and Collection Strategies: Matrices - ADMIRALTY INLET

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
AI-24		Bywater Bay (spit on north end) JEF0331 47°-53.375' N 122°-37.860' W	Exclusion/ Diversion - Keep oil out of bay.	4000'	Place 2 chevrons (500' each leg) in front of E and W low points on the spit. String 2000' between the chevrons.	Stage from the boat ramp north of Hood Canal bridge on west shore (JEF0311).	By boat from the ramp at the Hood Canal Bridge, possible access by ATV.	Sensitive nesting species, eelgrass, shellfish and baitfish.
AI-25		Bywater Bay at Hood Head JEF0330 47°-52.700' N 122°-37.655' W	Exclusion - Keep oil out of bay.	2500'	Place chevron at mouth of bay, 1000' west leg, 1500' east leg.	Stage from the boat ramp north of Hood Canal bridge on west shore (JEF0311).	By boat from the ramp at the Hood Canal Bridge, possible access by ATV.	Sensitive nesting species, eelgrass, shellfish and baitfish.
AI-26		Bywater Bay at Hood Head JEF0330 47°-52.915' N 122°-37.675' W	Deflection/ Collection - Deflect oil to west side of bay for collection.	2000'	Angle boom behind the chevron from Hood Head to the back of bay, collect any entrained oil in the NW corner of bay.	Stage from the boat ramp north of Hood Canal bridge on west shore (JEF0311).	By boat from the ramp at the Hood Canal Bridge, possible access by ATV.	Sensitive nesting species, eelgrass, shellfish and baitfish.
AI-27		Bywater Bay at Hood Head JEF0330 47°-53.340' N 122°-37.655' W	Exclusion - Keep oil out of bay/ mud flats.	200'	Place 200' between Bywater bay and small bay/ mud flats to the west.	Stage from the boat ramp north of Hood Canal bridge on west shore (JEF0311).	By boat from the ramp at the Hood Canal Bridge, possible access by ATV.	Sensitive nesting species, eelgrass, shellfish and baitfish.
AI-28		Northspit - tidal marsh south of Foulweather Bluff KIT0385 47°-55.790' N 122°-36.805' W	Exclusion - Keep oil out of marsh.	100'	Deploy boom across entrance to marsh at SE corner of spit.	Stage from the Salisbury Point County Park (KIT0435).	By boat from ramp at park.	Waterfowl and shorebird concentrations, marsh habitat.

**4.3.1.2 Proposed Booming and Collection Strategies: Matrices - ADMIRALTY INLET**

<b>Strategy</b>	<b>Status</b>	<b>Location</b>	<b>Response Strategy</b>	<b>Length of Boom</b>	<b>Strategy Implementation</b>	<b>Staging Area</b>	<b>Site Access</b>	<b>Resources Protected</b>
AI-29		Deer Lagoon ISL0489 47°-59.500' N 122°-29.175' W	Exclusion/ Diversion/ Collection - Keep oil out of lagoon.	700'	Angle boom from west side of lagoon entrance to a collection point on the east shore.	Stage from the Dave Mackie County Park (ISL0508).	By boat from ramp at Dave Mackie County Park (high tide only).	Waterfowl and shorebird concentrations; sensitive nesting species.
AI-30		Tidal marsh southeast of Deer Lagoon ISL0496 47°-59.290' N 122°-28.300' W	Exclusion - Keep oil out of marsh.	200'	Deploy boom across entrance to marsh at west end, will need a jon boat.	Stage from the Dave Mackie County Park (ISL0508).	Road access off road to Deer Lagoon from Bay View Road.	Waterfowl and shorebird concentrations.
AI-31		Cultus Bay ISL0522 47°-55.260' N 122°-23.630' W	Exclusion - Keep oil out of inner bay.	1500'	Deploy boom from the north end of the residential area on the sand spit at the Cultus Bay marina (private) and run the boom directly north to the nearest shoreline where there is access for vac trucks to set up a collection point.	Stage from the Possession boat ramp parking lot (ISL0003) or the Mukilteo State Park.	By boat from Possession ramp or Mukilteo State Park.	Waterfowl and shorebird concentrations; sensitive nesting species.



# QUILCENE

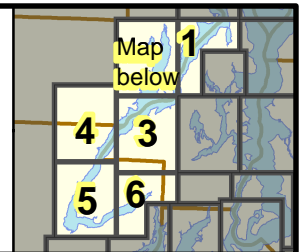
## *Proposed Booming Strategies*

February, 2003

### Hood Canal GRP





### MAP # 2

0 0.5 1 2 Miles



Area not included in GRPs

#### Legend

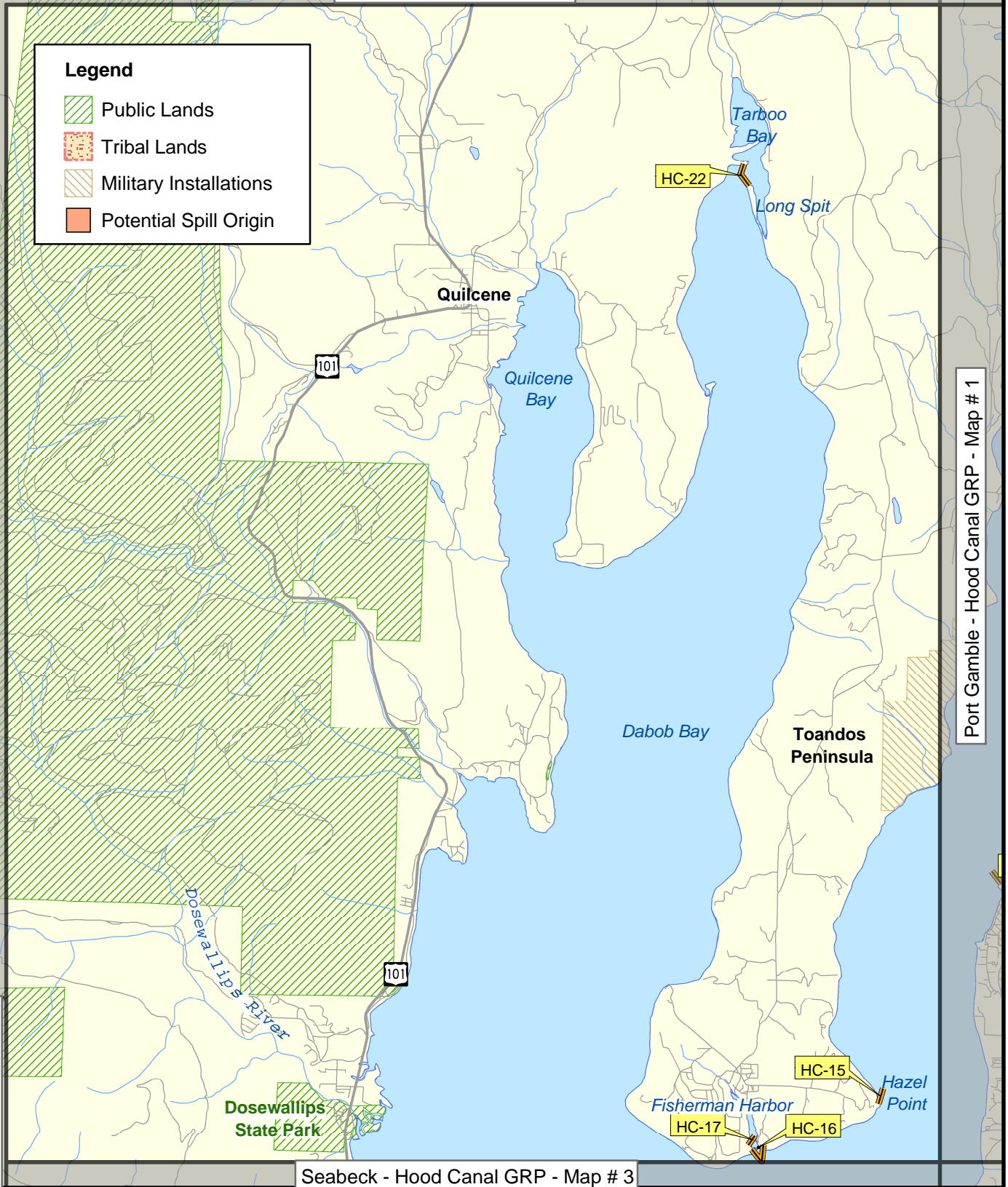
-  Public Lands
-  Tribal Lands
-  Military Installations
-  Potential Spill Origin

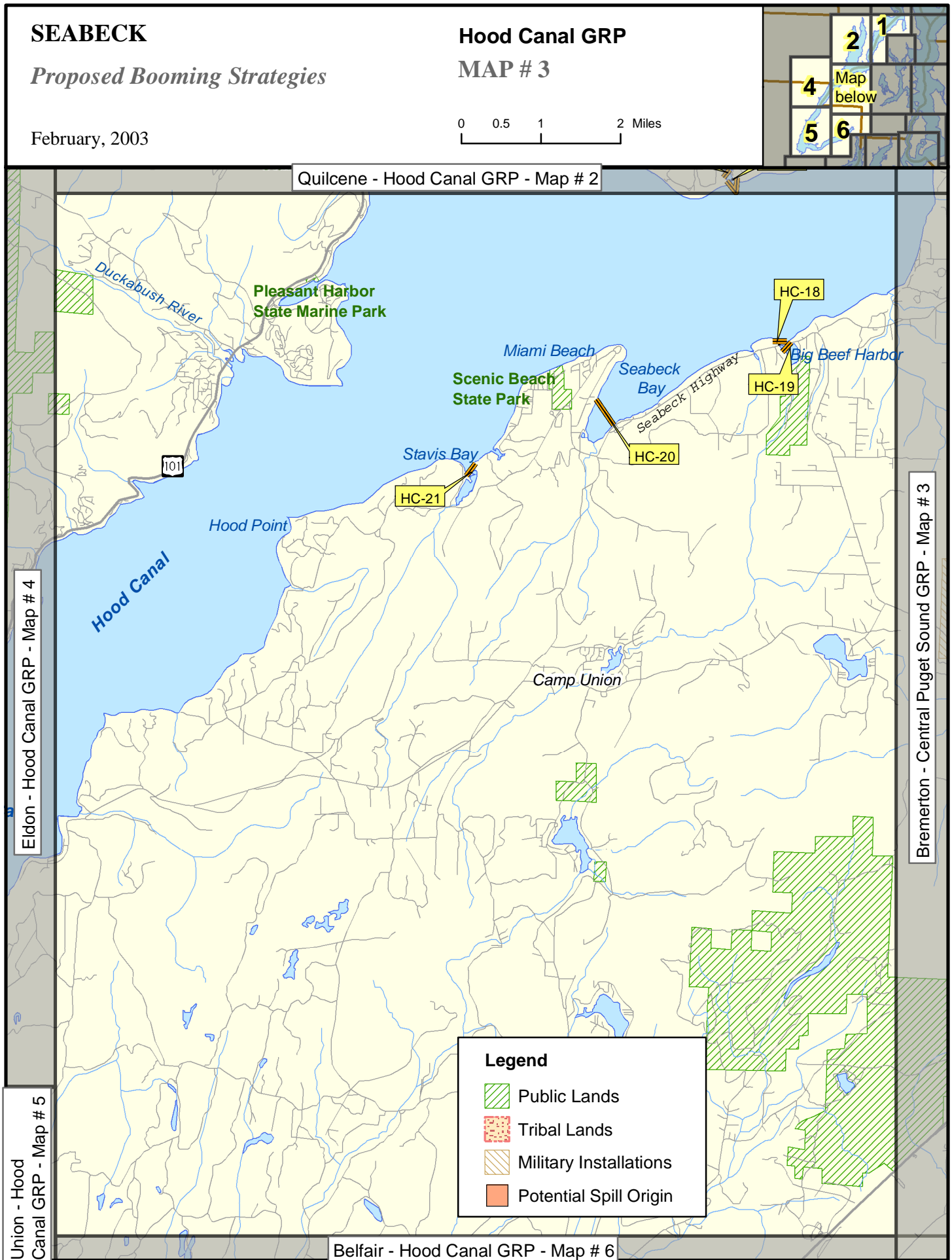
Area not included in GRPs

Eldon - Hood Canal GRP - Map # 4

Port Gamble - Hood Canal GRP - Map # 1

Seabeck - Hood Canal GRP - Map # 3





# ELDON

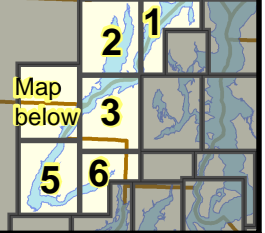
## *Proposed Booming Strategies*

February, 2003

### Hood Canal GRP

### MAP # 4

0 0.5 1 2 Miles



#### Legend

- Public Lands
- Tribal Lands
- Military Installations
- Potential Spill Origin

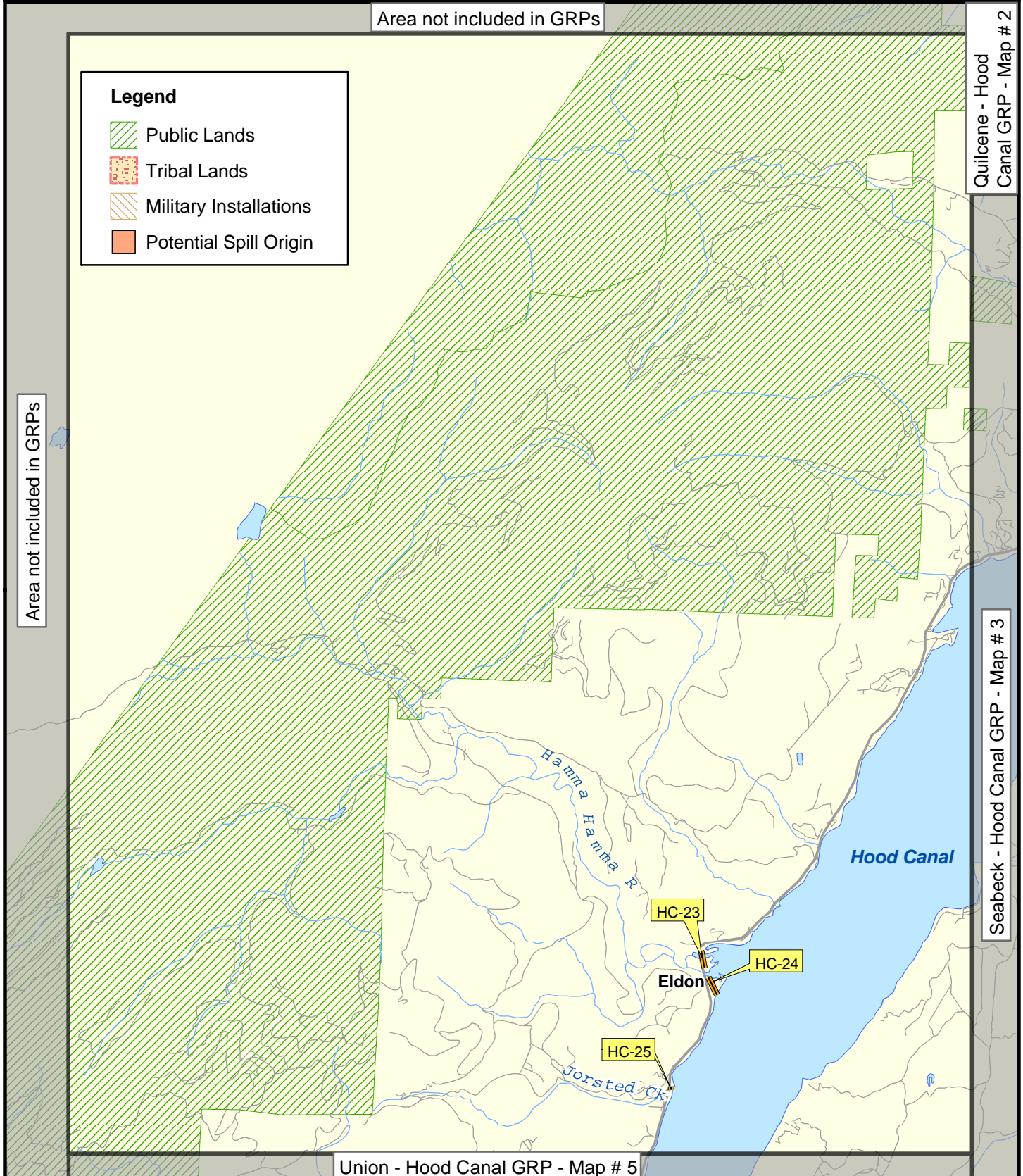
Area not included in GRPs

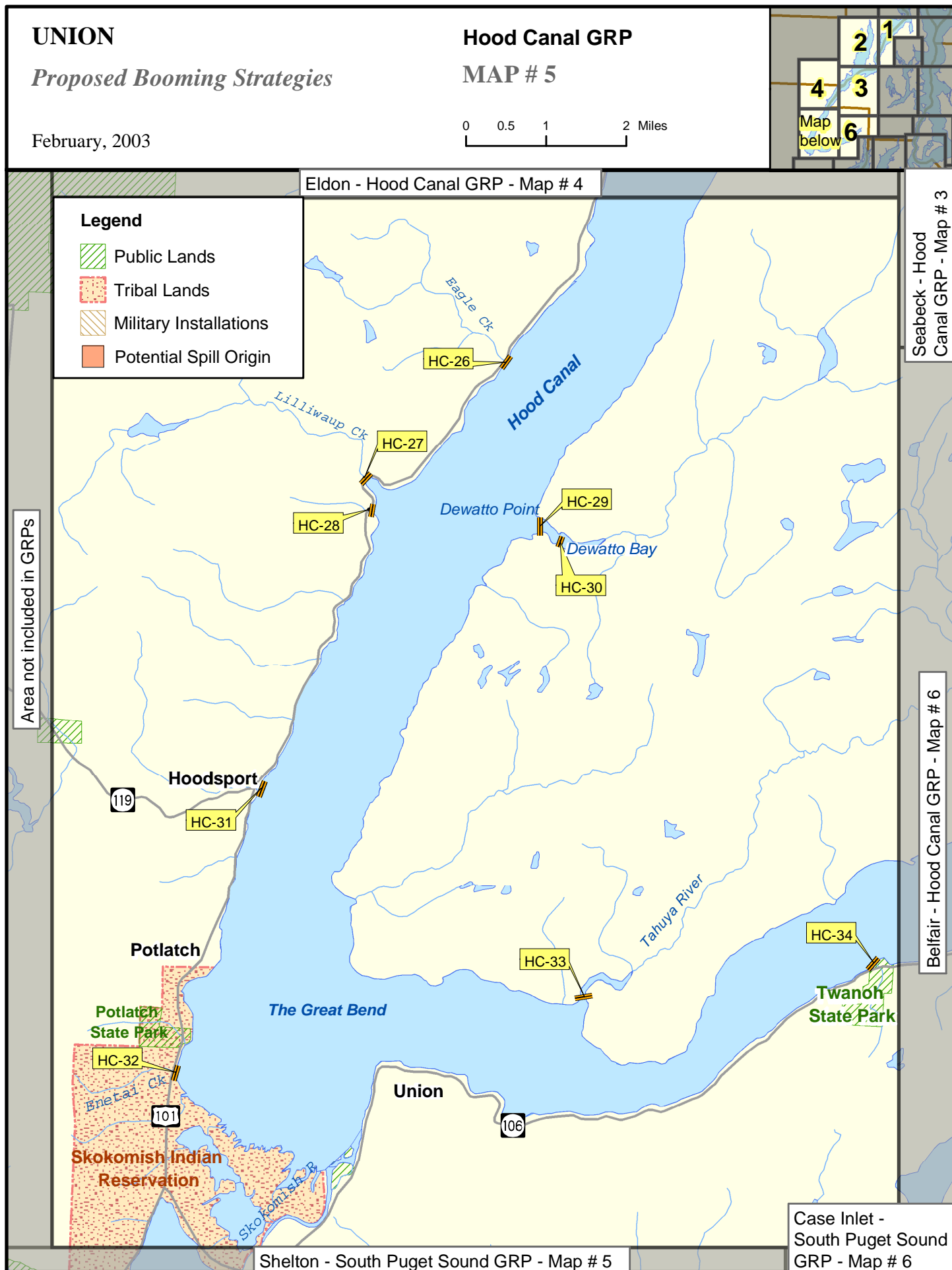
Area not included in GRPs

Quilcene - Hood Canal GRP - Map # 2

Seabeck - Hood Canal GRP - Map # 3

Union - Hood Canal GRP - Map # 5





# BELFAIR

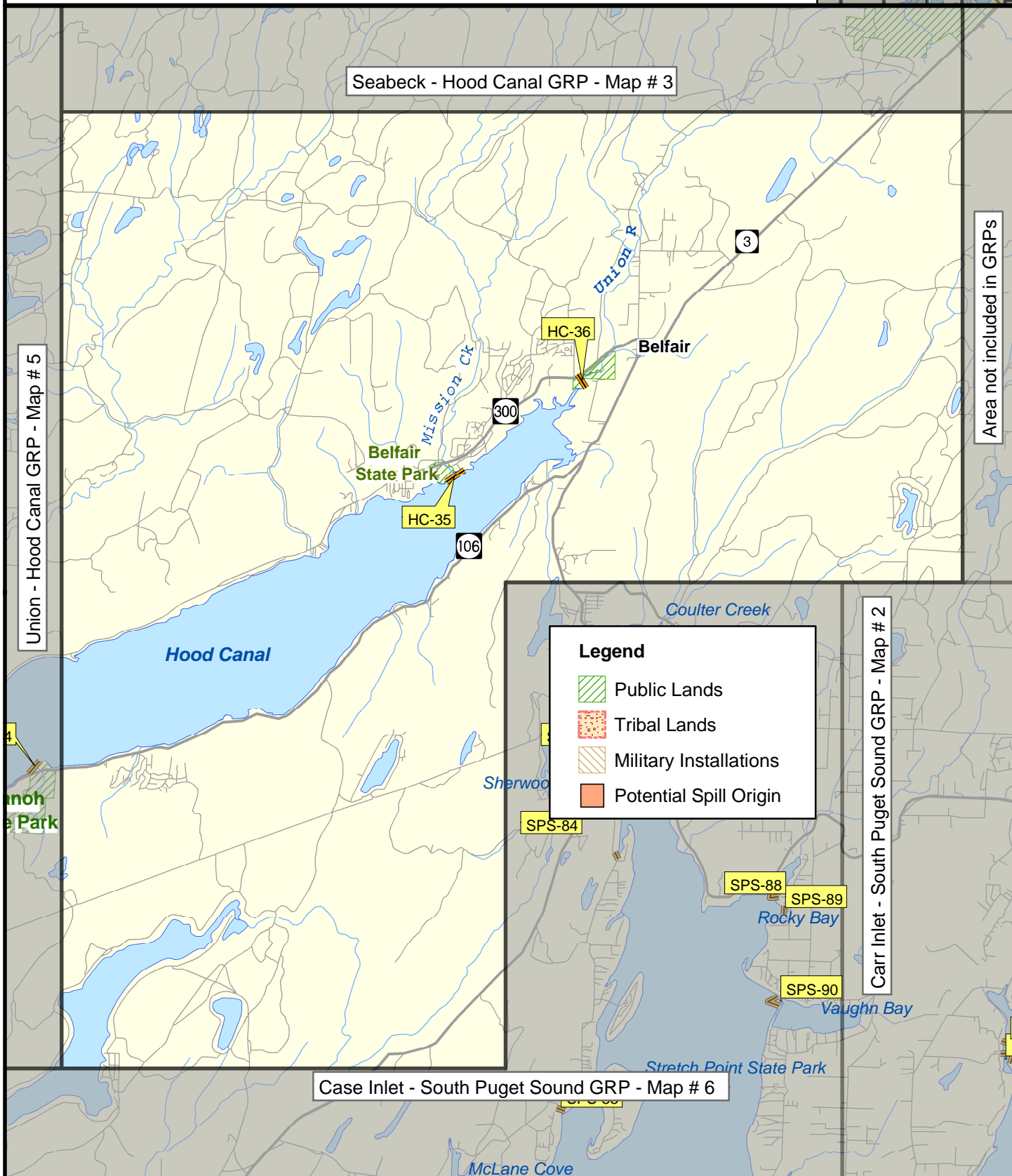
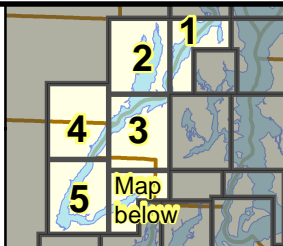
## Proposed Booming Strategies

February, 2003

### Hood Canal GRP

### MAP # 6

0 0.5 1 2 Miles



<b>4.3.2.2 Proposed Booming and Collection Strategies: Matrices - HOOD CANAL</b>								
<b>Strategy</b>	<b>Status</b>	<b>Location</b>	<b>Response Strategy</b>	<b>Length of Boom</b>	<b>Strategy Implementation</b>	<b>Staging Area</b>	<b>Site Access</b>	<b>Resources Protected</b>
HC-1		Port Gamble KIT0430 47°-51.360' N 122°-34.670' W	Deflection/ Collection - Keep oil out of Port Gamble.	1800'	Angle boom from Rip-Rap breakwater just North of Mill to pier at Pt. Julia. Collect oil with vac trucks at pier.	Stage from Port Gamble.	Boat, road access from Port Gamble mill and Port Gamble Indian Reservation (need permission).	Sensitive nesting species, seabird concentrations, baitfish spawning beaches, and marine mammal haulout.
HC-2		Port Gamble, south end KIT0421 47°-48.880' N 122°-34.675' W	Exclusion - Keep oil out of mud flats at south end of Port Gamble.	200'	Deploy boom across narrowest opening at east end of spit.	Stage from Port Gamble.	By boat from Port Gamble Indian Reservation (need permission).	Waterfowl and shorebird concentrations, mudflat habitat.
HC-3		Hood Canal Bridge KIT0436 and JEF0311 47°-51.585' N 122°-37.455' W	Enhanced Skimming - Keep oil out of Hood Canal.	2200'	Place boom at openings in Hood Canal bridge to funnel oil to skimmers w/ boom legs in "V" configuration (high priority strategy).	Stage from Salsbury Point County Park.	By boat, ramps on each side of bridge, some access from bridge.	Sensitive Hood Canal resources.
HC-4		Kitsap Memorial Park - North of Lofall KIT0446 47°-48.925' N 122°-39.359' W	Diversion/ Collection - Keep oil out of Hood Canal.	1000'	Angle boom from pier at old ferry dock to divert oil for collection. Will be necessary only when a west wind pushes the oil to this shore.	Stage from the South Point Ferry Dock old ferry building parking lot, Lofall Pier.	By boat, ramps on each side of the Hood Canal bridge, Kitsap Memorial Park.	Protect fish and wildlife resources.
HC-5		South end of Squamish Harbor N of South Pt. JEF0292 47°-51.034' N 122°-41.071' W	Exclusion - Keep oil from entering tidal marsh.	1200'	Deploy boom across north entrance to tidal marsh/ mud flats.	Stage from Port Gamble.	By boat from Termination Pt., Squamish Harbor, or Shine Tidelands.	Marsh habitat and associated fish & wildlife.

4.3.2.2 Proposed Booming and Collection Strategies: Matrices - HOOD CANAL								
Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
HC-6		South end of Squamish Harbor N of South Pt. JEF0286 47°-50.523' N 122°-40.989' W	Exclusion - Keep oil from entering tidal marsh.	300'	Deploy boom across entrance to private marina to prevent oil from entering marsh behind breakwater.	Stage from Port Gamble.	By boat from Termination Pt., Squamish Harbor, or Shine Tidelands.	Marsh habitat and associated fish & wildlife.
HC-7		South end of Squamish Harbor N of South Pt. JEF0286 47°-50.581' N 122°-41.029' W	Exclusion - Keep oil from entering tidal marsh.	500'	Deploy boom from breakwater to the sand spit to the north.	Stage from Port Gamble.	By boat from Termination Pt., Squamish Harbor, or Shine Tidelands.	Marsh habitat and associated fish & wildlife.
HC-8		South Point JEF0283 47°-49.945' N 122°-41.242' W	Diversion/ Collection - Keep oil out of Hood Canal.	1000'	Angle boom to divert oil into collection area near old ferry dock. Need boat to tend end of boom. Will be necessary only if an east wind pushes the oil to this shore.	Stage from the South Point Ferry Dock old ferry building parking lot, Lofall Pier.	Shine Tidelands and other access point south of Lofall owned by the Navy - contact COMNAVBASE Seattle.	Protect fish and wildlife resources.
HC-9		Thorndike Bay JEF0267 47°-48.585' N 122°-44.653' W	Exclusion - Prevent oil from entering inner mouth of bay.	200'	Boom across gap in spit, anchor to shore. Water breaches spit at extreme high tide.	Stage from Lofall or Bangor.	By boat from Bangor or Lofall; vehicle access to spit from S Point - Thorndyke Road.	Sensitive nesting species, waterfowl concentrations.
HC-10		Bangor KIT0463 47°-45.302' N 122°-43.304' W	Diversion/ Collection - Collect oil at pier.	500'	Place collection boom at Explosive Handling wharf.	On site; gyms/mess facilities on base (5-7 miles from water).	Roads available from Bangor - contact COMNAVBASE Seattle.	Protect fish and wildlife resources.

4.3.2.2 Proposed Booming and Collection Strategies: Matrices - HOOD CANAL								
Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
HC-11		Bangor KIT0464 47°-44.867' N 122°-43.679' W	Diversion/ Collection - Collect oil at pier.	500'	Place collection boom at Service Pier.	On site; gyms/mess facilities on base (5-7 miles from water).	Roads available from Bangor - contact COMNAVBASE Seattle.	Protect fish and wildlife resources.
HC-12		Bangor KIT0465 47°-44.625' N 122°-44.020' W	Diversion/ Collection - Collect oil at pier.	500'	Place collection boom at Delta Pier.	On site; gyms/mess facilities on base (5-7 miles from water).	Roads available from Bangor - contact COMNAVBASE Seattle.	Protect fish and wildlife resources.
HC-13		Bangor KIT0467 47°-44.176' N 122°-44.418' W	Diversion/ Collection - Collect oil at pier.	500'	Place collection boom at Marginal Pier.	On site; gyms/mess facilities on base (5-7 miles from water).	Roads available from Bangor - contact COMNAVBASE Seattle.	Protect fish and wildlife resources.
HC-14		Bangor KIT0468 47°-43.770' N 122°-44.635' W	Diversion/ Collection - Collect oil at pier.	500'	Place collection boom at KB docks.	On site; gyms/mess facilities on base (5-7 miles from water).	Roads available from Bangor - contact COMNAVBASE Seattle.	Protect fish and wildlife resources.
HC-15		Hazel Point JEF0234 47°-41.594' N 122°-46.271' W	Diversion/ Collection - Keep oil out of Hood Canal.	1000'	Angle boom from shore to divert oil to collection area near houses. Need to tend end of boom w/ boat. Use land anchor or chain bridle on Rip Rap.	Stage from Lofall or Bangor.	By boat from Bangor or Seabeck; road access from Dabob - Coyle Rd (dirt road access - difficult for vac. trucks) may need to bring in portable skimmers.	Sensitive nesting species; other Hood Canal resources.

4.3.2.2 Proposed Booming and Collection Strategies: Matrices - HOOD CANAL								
Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
HC-16		Fisherman Harbor JEF0229 47°-41.142' N 122°-48.007' W	Exclusion - Keep oil out of harbor.	600'	Place chevron in front of harbor entrance. Low potential for oil to enter harbor.	Stage from Seabeck at Pleasant Harbor.	By boat from Seabeck or Bangor.	Shellfish, crabs & salmonids.
HC-17		Fisherman Harbor, backup JEF0229 47°-41.218' N 122°-48.091' W	Exclusion - Keep oil out of harbor.	600'	If strategy at harbor entrance cannot be deployed, move back behind sand spit.	Stage from Seabeck at Pleasant Harbor.	By boat from Seabeck or Bangor.	Shellfish, crabs & salmonids.
HC-18		Big Beef Harbor (east of Seabeck) KIT0486 47°-39.351' N 122°-47.163' W	Exclusion - Keep oil out of harbor.	100'	Deploy boom across entrance to harbor at road crossing.	Stage from Seabeck or Scenic Beach State Park.	From the bridge at Seabeck Highway.	Sensitive nesting species; shorebird concentration; hatchery.
HC-19		Big Beef Harbor, backup KIT0486 47°-39.309' N 122°-47.052' W	Exclusion - Keep oil out of harbor.	400'	If strategy at bay entrance fails, move back behind bridge, will need a small boat or skiff.	Stage from Seabeck or Scenic Beach State Park.	From the bridge at Seabeck Highway.	Sensitive nesting species; shorebird concentration; hatchery.
HC-20		Seabeck Bay KIT0492 47°-38.405' N 122°-50.471' W	Exclusion/ Diversion/ Collection - Keep oil out of bay.	2000'	Anchor boom to shore just south of marina at rip-rap and run to opposite side of bay at an angle to collect at the road. A north wind is likely to push any oil from the north into Seabeck Bay.	Stage from Seabeck or Scenic Beach State Park.	By boat from the ramp at Miami Beach or at Seabeck; vehicle access from the Seabeck Highway.	Waterfowl concentrations and baitfish spawning.
HC-21		Stavis Bay KIT0507 47°-37.858' N 122°-52.083' W	Exclusion - Keep oil out of bay.	200'	Place boom across entrance to marsh area. Can be deployed from land, may need a jon boat at high tide.	Stage from Seabeck.	By boat from Miami Beach or Seabeck; vehicle access from private property.	Salmon and marsh habitat.

<b>4.3.2.2 Proposed Booming and Collection Strategies: Matrices - HOOD CANAL</b>								
<b>Strategy</b>	<b>Status</b>	<b>Location</b>	<b>Response Strategy</b>	<b>Length of Boom</b>	<b>Strategy Implementation</b>	<b>Staging Area</b>	<b>Site Access</b>	<b>Resources Protected</b>
HC-22		Tarboo Bay (upper) JEF0161 47°-50.594' N 122°-48.773' W	Exclusion - Keep oil out of bay.	1500'	Deploy boom in chevron from Long spit to opposite shore. High tide strategy, area becomes a mud flat at low tide.	Stage from Quilcene Marina, Seabeck or Pleasant Harbor.	By shallow draft boat from Quilcene; potential vehicle access from Carl Johnson Rd.	Marine mammal haulouts, waterfowl and crab.
HC-23		Hamma Hamma Estuary MAS0637 47°-32.903' N 123°-2.609' W	Exclusion - Keep oil out of tidal marsh.	500'	Deploy boom across entrance to tidal marsh at bridge on highway 101. Can be depolyed from land, may need a jon boat.	Stage from the Hamma Hamma Oyster Co.	From Highway 101.	Waterfowl concentrations; sensitive nesting species.
HC-24		Hamma Hamma River MAS0637 47°-32.729' N 123°-2.533' W	Exclusion - Keep oil out of river.	300'	Deploy boom across river at bridge on highway 101. Can be deployed from land, may need a jon boat.	Stage from the Hamma Hamma Oyster Co.	From Highway 101 and dirt road on northeast side of bridge.	Waterfowl concentrations; sensitive nesting species, salmon.
HC-25		Jorsted Creek MAS0631 47°-31.560' N 123°-3.023' W	Exclusion - Keep oil out of creek mouth.	200'	Deploy boom at angle across creek mouth. Unlikely to enter creek mouth except on high spring tide. Can be deployed from land.	Stage from the Hamma Hamma Oyster Co.	From Highway 101. Private Property adjacent to creek.	Salmon.
HC-26		Eagle Creek MAS0620 47°-29.087' N 123°-4.676' W	Exclusion - Keep oil out of creek mouth.	100'	Deploy boom at angle across creek mouth. Unlikely to enter creek mouth except on high spring tide. Can be deployed from land.	Stage from the Hamma Hamma Oyster Co.	From Highway 101.	Salmon.
HC-27		Lilliwaup Creek Estuary MAS0611 47°-27.802' N 123°-6.836' W	Exclusion - Keep oil out of creek and estuary.	300'	Deploy boom at angle across river at bridge on Highway 101. Can be deployed from land, may need a jon boat.	Stage from the parking area near the bridge over Lilliwaup Creek.	From Highway 101.	Waterfowl and shorebird concentrations; salmon.

### 4.3.2.2 Proposed Booming and Collection Strategies: Matrices - HOOD CANAL

Strategy	Status	Location	Response Strategy	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
HC-28		Small creek south of Lilliwaup Creek MAS0607 47°-27.447' N 123°-6.768' W	Exclusion - Keep oil out of creek.	100'	Deploy boom at angle across creek mouth. Unlikely to enter creek mouth except on high spring tide. Can be deployed from land.	Stage from the parking area near the bridge over Lilliwaup Creek.	From Highway 101.	Salmon.
HC-29		Dewatto Bay MAS0410 47°-27.237' N 123°-4.036' W	Exclusion - Keep oil out of inlet & river.	1500'	Deploy boom from Dewatto Pt. north to opposite shore.	Stage from the Hamma Hamma Oyster Co. or Hoodspport WDFW hatchery.	Vehicle access from the Dewatto - Holly Road on the south side of the bay; by boat from Hoodspport on the north side.	Protect eelgrass beds at mouth of bay; sensitive nesting species; shorebird concentrations; salmonids in river.
HC-30		Dewatto Bay MAS0413 47°-27.116' N 123°-3.731' W	Exclusion - Keep oil out of inlet & river.	800'	Backup for HC-29. Deploy boom from spit on north shore to closest point on opposite shore. May need a shallow draft boat, area becomes a mudflat at low tide.	Stage from the Hamma Hamma Oyster Co. or Hoodspport WDFW hatchery.	Vehicle access from the Dewatto - Holly Road on the south side of the bay; by boat from Hoodspport on the north side.	Protect eelgrass beds at mouth of bay; sensitive nesting species; shorebird concentrations; salmonids in river.
HC-31		Hoodspport MAS0593 47°-24.386' N 123°-8.313' W	Exclusion - Prevent oil from impacting WDFW hatchery.	100'	Boom off fish weir on S side of hatchery (high tide strategy). Can be deployed from land.	Stage from the WDFW hatchery.	By vehicle on the road to the hatchery.	WDFW hatchery.
HC-32		Enetai Creek MAS0580 47°-21.288' N 123°-9.556' W	Exclusion - Prevent oil from impacting Tribal hatchery.	100'	Deploy boom across creek south of Potlatch State Park. Can be deployed from land.	Stage from the Tribal hatchery or Potlatch State Park.	From Highway 101.	Tribal hatchery, salmon.

<b>4.3.2.2 Proposed Booming and Collection Strategies: Matrices - HOOD CANAL</b>								
<b>Strategy</b>	<b>Status</b>	<b>Location</b>	<b>Response Strategy</b>	<b>Length of Boom</b>	<b>Strategy Implementation</b>	<b>Staging Area</b>	<b>Site Access</b>	<b>Resources Protected</b>
HC-33		Tahuya River MAS0452 47°-22.242' N 123°-3.088' W	Exclusion - Keep oil out of river.	400'	Deploy boom across narrowest point of river mouth.	Stage from the Twanoh State Park.	By boat from the Potlatch State Park or Union; vehicle access from private property off the North Shore Road.	Salmonids and shellfish habitat; seabird, waterfowl, and shorebird concentration areas.
HC-34		Twanoh State Park MAS0534 47°-22.715' N 122°-58.472' W	Exclusion - Protect creek at State Park.	100'	Deploy boom across creek mouth at Twanoh State Park. Can be deployed from land.	Stage from the Twanoh State Park.	From Highway 106 to the Twanoh State Park.	State Park and salmon.
HC-35		Mission Creek MAS0489 47°-25.850' N 122°-52.370' W	Exclusion - Keep oil out of creek.	100'	Deploy boom across the mouth of the creek. Can be deployed from land.	Stage from the Belfair State Park.	Vehicle access from the Belfair State Park, off the North Shore Road.	State Park and salmon.
HC-36		Union River MAS0499 47°-26.755' N 122°-50.435' W	Exclusion - Prevent oil from moving into river.	200'	Deploy boom across river at first access point in river mouth. Necessary at high tide only, river flow at low tide will prevent oil from moving upstream. Can be deployed from land with a jon boat.	Stage from the Belfair or Twanoh State Park.	Vehicle access from the North Shore Road.	Waterfowl concentrations, sensitive nesting species, wetlands, salmon.

## APPENDICES

## Appendix A: Summary of Protection Techniques

Protection Techniques	Description	Primary Logistical Requirements	Limitations
<b>ONSHORE</b>			
<b>Beach Berms</b>	A berm is constructed along the top of the mid-inter tidal zone from sediments excavated along the downgradient side. The berm should be covered with plastic or geo-textile sheeting to minimize wave erosion.	<ul style="list-style-type: none"> <li>• Bulldozer/Motor grader -1</li> <li>• Personnel - equipment operator &amp; 1 worker</li> <li>• Misc. - plastic or geotextile sheeting</li> </ul>	<ul style="list-style-type: none"> <li>• High wave energy</li> <li>• Large tidal range</li> <li>• Strong along shore currents</li> </ul>
<b>Geotextiles</b>	A roll of geotextile, plastic sheeting, or other impermeable material is spread along the bottom of the supra-tidal zone & fastened to the underlying logs or stakes placed in the ground.	<ul style="list-style-type: none"> <li>• Geotextile - 3 m wide rolls</li> <li>• Personnel - 5</li> <li>• Misc. - stakes or tie-down cord</li> </ul>	<ul style="list-style-type: none"> <li>• Low sloped shoreline</li> <li>• High spring tides</li> <li>• Large storms</li> </ul>
<b>Sorbent Barriers</b>	A barrier is constructed by installing two parallel lines of stakes across a channel, fastening wire mesh to the stakes & filling the space between with loose sorbents.	Per 30 meters of barrier <ul style="list-style-type: none"> <li>• Wire mesh - 70 m x 2 m</li> <li>• Stakes - 20</li> <li>• Sorbents - 30 m<sup>2</sup></li> <li>• Personnel - 2</li> <li>• Misc. - fasteners, support lines, additional stakes, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Waves &gt; 25 cm</li> <li>• Currents &gt; 0.5 m/s</li> <li>• Tidal range &gt; 2 m</li> </ul>
<b>Inlet Dams</b>	A dam is constructed across the channel using local soil or beach sediments to exclude oil from entering channel.	<ul style="list-style-type: none"> <li>• Loader - 1</li> <li>• Personnel - equipment operator &amp; 1 worker or several workers w/shovels</li> </ul>	<ul style="list-style-type: none"> <li>• Waves &gt; 25 cm</li> <li>• Tidal range exceeding dam height</li> <li>• Freshwater outflow</li> </ul>

<b>NEARSHORE</b>			
<b>Containment Booming</b>	Boom is deployed in a "U" shape in front of the oncoming slick. The ends of the booms are anchored by work boats or drogues. The oil is contained within the "U" & prevented from reaching the shore.	For 150 meters Slick: <ul style="list-style-type: none"> <li>• Boom - 280 m</li> <li>• Boats - 2</li> <li>• Personnel - boat crews &amp; 4 boom tenders</li> <li>• Misc. - tow lines, drogues, connectors, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• High winds</li> <li>• Swells &gt; 2 m</li> <li>• Breaking waves &gt; 50 cm</li> <li>• Currents &gt; 1.0 m/s</li> </ul>
<b>Exclusion Booming</b>	Boom is deployed across or around sensitive areas & anchored in place. Approaching oil is deflected or contained by boom.	Per 300 meters of Boom <ul style="list-style-type: none"> <li>• Boats - 1</li> <li>• Personnel - boat crew &amp; 3 boom tenders</li> <li>• Misc.- 6 anchors, anchor line, buoys, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Currents &gt; 0.5 m/s</li> <li>• Breaking waves &gt; 50 cm</li> <li>• Water depth &gt; 20 m</li> </ul>
<b>Deflection Booming</b>	Boom is deployed from the shoreline away from the approaching slick & anchored or held in place with a work boat. Oil is deflected away from shoreline.	Single Boom, 0.75 m/s knot current <ul style="list-style-type: none"> <li>• Boom - 60 m</li> <li>• Boats - 1</li> <li>• Personnel - boat crew + 3</li> <li>• Misc. - 3 anchors, line, buoys, recovery unit</li> </ul>	<ul style="list-style-type: none"> <li>• Currents &gt; 1.0 m/s</li> <li>• Breaking waves &gt; 50 cm</li> </ul>
<b>Diversion Booming</b>	Boom is deployed from the shoreline at an angle towards the approaching slick & anchored or held in place with a work boat. Oil is diverted towards the shoreline for recovery.	Single Boom, 0.75 m/s knot current <ul style="list-style-type: none"> <li>• Boom - 60 m</li> <li>• boats - 1</li> <li>• Personnel - boat crew + 3</li> <li>• Misc. - 3 anchors, line, buoys, recovery unit</li> </ul>	<ul style="list-style-type: none"> <li>• Currents &gt; 1.0 m/s</li> <li>• Breaking waves &gt; 50 cm</li> </ul>
<b>Skimming</b>	Self-propelled skimmers work back & forth along the leading edge of a windrow to recover the oil. Booms may be deployed from the front of a skimmer in a "V" configuration to increase sweep width. Portable skimmers are placed within containment booms in the area of heaviest oil concentration.	Self-propelled (None) Towed <ul style="list-style-type: none"> <li>• Boom - 200 m</li> <li>• Boats - 2</li> <li>• Personnel - boat crews &amp; 4 boom tenders</li> <li>• Misc. - tow lines, bridles, connectors, etc.</li> </ul> Portable <ul style="list-style-type: none"> <li>• Hoses - 30 m discharge</li> <li>• Oil storage - 2000 liters</li> </ul>	<ul style="list-style-type: none"> <li>• High winds</li> <li>• Swells &gt; 2 m</li> <li>• Breaking waves &gt; 50 cm</li> <li>• Currents &gt; 1.0 m/s</li> </ul>

**Appendix B: Original Geographic Response Plan Contributors****Local Representatives**

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**Washington Department of Wildlife**

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Ted George, S'Klallam Tribe

**Other**

Barbara Blowers, Puget Sound Solutions

**Appendix C: Geographic Response Plan Comments/Corrections/Suggestions**

If you have any questions regarding this document or find any errors, please notify one of the following agencies:  
or use tear out sheet (page C-3)

- Washington Department of Ecology, SPPR program, Natural Resources Unit
- USCG Marine Safety Office Puget Sound, Planning Department
- USCG Marine Safety Office Portland
- Oregon Department of Environmental Quality
- Idaho Emergency Response Commission
- Environmental Protection Agency Region 10

**Phone Numbers:**

Washington DOE	(360) 407-6972
USCG MSO Puget Sound	(206) 217-6213
USCG MSO Portland	(503) 240-9307
Oregon DEQ	(503) 229-5774
Idaho ERC	(208) 334-3263
EPA	(206) 553-6901

**Bulletin Board System (BBS):**

USCG MSO Puget Sound	(206) 217-6216
USCG MSO Portland	(503) 240-9308

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**Address:**

Commanding Officer United States Coast Guard MSO Puget Sound Planning Department 1519 Alaskan Way South Seattle, WA 98134-1192	Washington Department Of Ecology SPPR Program Natural Resources Unit P.O. Box 47600 Olympia, WA 98504-7600	Office Of The Governor Idaho Emergency Response Commission 1109 Main Statehouse Boise, ID 83720-7000
Commanding Officer United States Coast Guard Planning Department MSO Portland 6767 North Basin Ave Portland, OR 97217-3992	Oregon Department of Environmental Quality Water Quality Division 811 SW Sixth Avenue Portland, OR 97204	Environmental Protection Agency Emergency Response Branch 1200 Sixth Avenue Seattle, WA 98101

***Geographic Response Plan*****Comments/Corrections/Suggestions****Directions:**

Fill in your name, address, agency, and phone number. Fill in the blanks regarding the location of information in the plan being commented on. Make comments in the space provided. Add extra sheets as necessary. Submit to: Dale Davis

Department of Ecology  
Spills Program  
300 Desmond Drive  
P.O. Box 47600  
Olympia, WA 98504-7600  
dald461@ecy.wa.gov

Name: _____	Title: _____	Agency: _____
Address: _____		
City: _____	State/Province: _____	Zip/Postal Code: _____
Phone: (____) _____	E-Mail: _____	

GRP: _____	Page Number: _____
Location on page (chapter, section, paragraph) (e.g. 2.1, paragraph 3): _____	

Comments: _____

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Northwest Area Committee  
c/o Washington Department of  
Ecology  
Spills Program  
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